

In This Issue—*Choosing the Proper Equipment*

MOTOR AGE

Vol. XLIV
Number 25

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, DECEMBER 20, 1923

Thirty-five Cents a Copy
Three Dollars a Year

The New ESSEX A SIX

Built by Hudson under Hudson Patents

Wouldn't You Like To Sell It?

This greatest Essex value offers the most outstanding opportunity for new dealers in the motor industry. It enters at once into the largest production in our history.

Essex closed car comforts now cost \$170 less than ever before. And with this lower price are an even more attractive Coach body and a six-cylinder motor, built on the principle of the famous Hudson Super-Six.

In all advantages of dealer and owner appeal it surpasses even the former products by which the prosperity of Hudson and Essex dealers was built. With the new Essex you sell the lowest priced six-cylinder 5-passenger closed car on the market.

A ride will convince you that nothing like it in quality is obtainable within hundreds of dollars of its price. The line consists of only the Coach and the touring car. No slow turning models. No large line to tie up capital and waste selling effort. And best of all your profits are not sunk in excessive free service.

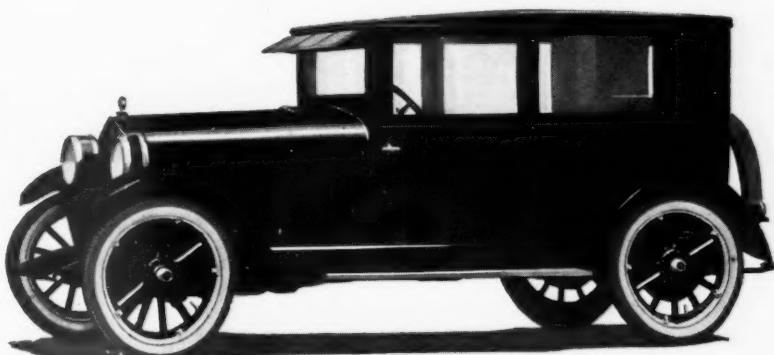
A finance plan of liberal terms will assist you in that important phase of your business.

See the new Essex at once. Ride in it. It is going to make money for dealers. Will you share in these profits? Write or wire today.

ESSEX MOTORS
DETROIT, MICHIGAN

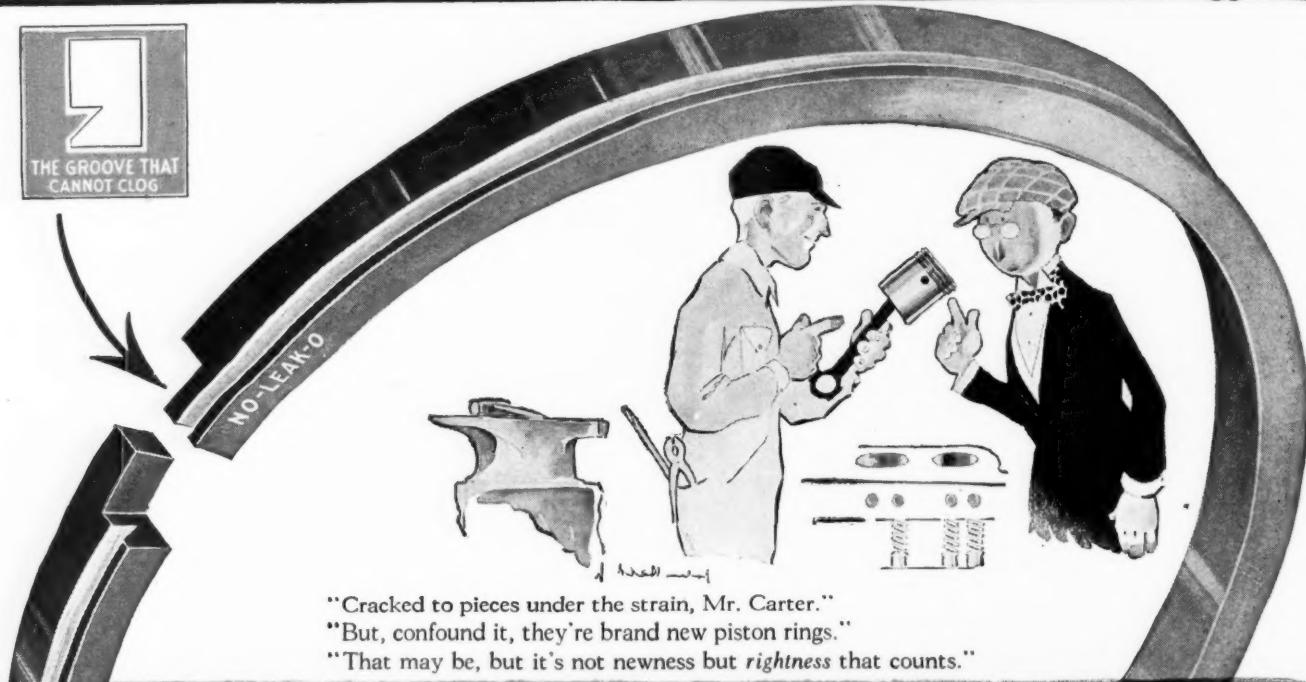
**The
Coach
\$975**

Touring Model - \$850
Freight and Tax Extra



PREVENTABLE TROUBLES—No. 9—BROKEN PISTON RINGS

Does the Piston Ring You Use Cause or Prevent Them?



"Cracked to pieces under the strain, Mr. Carter."

"But, confound it, they're brand new piston rings."

"That may be, but it's not newness but rightness that counts."

NO-LEAK-O

Piston Rings

Made in one piece, easy to install, quick seating, of finest material, guaranteed against breakage and individually tested for accuracy. Brinnel tested for correct hardness. Give equal tension on the cylinder walls. The leading replacement ring. Over 200 reliable jobbers carry No-Leak-O in standard sizes and over sizes.

Your judgment is really what you are selling from day to day. Your "say-so" can mean dollars saved or dollars lost to your customers, depending upon whether or not your good judgment is backed up by the good performance of the replacement materials you use. Don't take a chance on having Mr. Carter say, "Oh, he didn't use good judgment" when it really was the piston rings that went wrong. Use the right kind of piston ring and get the right results. That's No-Leak-O.

No-Leak-Os "won't leak because they're sealed with oil." A specially cut groove—the "oilSEALing" groove—found only in No-Leak-O Piston Rings—packs an oil film in between your piston and cylinder walls like "packing" in a pump. This oil "packing" seals in all the expanding gas. Every drop must work. By simply reversing the top ring, no unburnt gas or coal oil can seep down into the crank case to thin out lubrication. In this way No-Leak-O prevents 75% of all motor troubles. No-Leak-Os hold your customers because they make the right repair job, use less oil, less gas and give more Power.

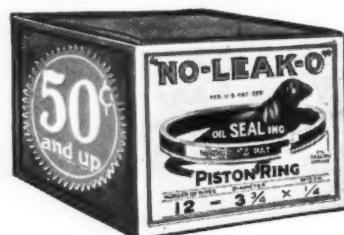
Write for valuable booklet, "How to Fit Piston Rings." Also let us tell you how our liberal dealer proposition can increase your profits.

One Price during eight years of continued success.
One design—for all cars—50c and up.

NO-LEAK-O PISTON RING COMPANY

Dept. 180

Muskegon, Michigan



Important: In buying Piston Rings insist on the genuine No-Leak-O with the original "oilSEALing" groove, packed in this standard package bearing the famous ring and seal, our registered trademark. Beware of imitations.

WON'T LEAK
because they're sealed with Oil

MOON

in

Wollaston

Mass.

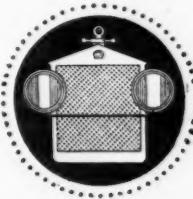


What's Population to a Go-Getter with the Moon?

The sale of 69 Moon cars in 10 months in a town of less than 500 population, is the record of T. A. Winsloe, Wollaston Centre Garage, Wollaston, Mass. That's what a "go-getter" with the Moon franchise can do when he cares not a rap for the "how-many-people-have-we" way of figuring sales possibilities. Here's Mr. Winsloe's own statement of results:

"We sold 36 Moon cars during the first 7 months of 1923—and 33 in the 3 months of August, September, October. You said the Moon was a big seller in the small town, as well as in the large cities. Now we've proved it. And just watch us in 1924."

Think what you and Moon can do in 1924!



MOON MOTOR CAR COMPANY, ST. LOUIS, U. S. A.
Stewart McDonald, President



There Is Money In Oil

Many garages throughout America are losing substantial profit by not trying to sell their customers lubricating oil for their motor cars or motor trucks.

We believe you will be gratified at the results which come from continuously suggesting to customers the desirability of changing the oil in the crankcase, or of asking them if they need oil, before they drive their cars out of your garage.

Buy oil in bulk. Store it safely in tanks. Deliver it to the measure quickly, and cleanly, through a Wayne Oil Pump.

A Wayne representative will gladly discuss your individual problem with you, and make recommendations based upon your needs. This service, Wayne offers without any obligation on your part. Furthermore, Wayne will install the equipment you require, make sure that it is operating at 100% efficiency, and then stand back of it with a guarantee of your entire and continued satisfaction.

Write for catalog showing various kinds of garage oil storage and measuring equipment.

Wayne Tank & Pump Co., 706 Canal St., Fort Wayne, Ind.

Wayne Tank & Pump Co. of Canada, (Limited), Toronto, Ontario, Canada

Wayne Tank and Pump Company, 9 Kingsway, London, W. C. 2, England

Division Offices in: Atlanta, Boston, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Dayton, Des Moines, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Peoria, Philadelphia, Pittsburgh, San Francisco, St. Louis and South Bend

Warehouses in: Philadelphia and San Francisco

An International Organization with Sales and Service Offices Everywhere

REG. U.S. TRADE MARK

wayne

HONEST MEASURE PUMPS

MOTOR AGE

Reg. U. S. Pat. Off.
Published Every Thursday by

THE CLASS JOURNAL COMPANY

5 So. Wabash Ave.
Chicago, Ills., U. S. A.

Vol. XLIV Chicago, December, 1923 No. 25

CONTENTS

Shop Equipment Direct Means for Making Greater Profit	9
By B. M. Ikert	
The Broad Scope of Automobile Dealers' Association Activities	13
By Robert E. Lee	
How Constant Potential Was Discovered in Mudville	15
By A. H. Packer	
Young Tom Socks It Home	17
By James V. Malone	
A Tire Business Built On—Personal Contact—Right Treatment—Location—Special Advertising—and it Pays	19
Keeping Down the Upkeep Cost Through Service Bulletins	22
Engineering for the Service Man—No. 8	23
Seven Little Service Men	25
MOTOR AGE'S Picture Pages of Automotive Interest	26
Editorials—	
Traffic	28
Tires	28
"A Higher Score in '24"	28
What Old Scrooge Might See	29
News of the Industry—	
Tax Repeal Bills Introduced	30
No Decline in December Production	31
\$250,000,000 Worth of Cars in 1924, Is Willys Plan	32
Jordan Stockholders May Let Jordan Cars Be Their Santa	32
Motor Truck and Stage Lines Play Big Part in California	33
U. S. Court Enjoins Sale of Reconditioned Bearings as News	34
Propose Coloring Gasoline to Insure Safe Handling	35
775 Dealers Gather Dec. 10 at St. Louis District Meet	35
Willys-Overland Earnings in 1923 to Exceed \$12,000,000	36
Condition of Industry Is Described as Noteworthy	36
Salable Merchandise, Character, Capacity, Capital, Essentials of Automobile Dealer	37
Plans for Service Congress in Detroit Near Completion	38
Thomas H. Field, Latest in Car Makers in Wisconsin	39
Concerning Men You Know	40
Business Notes	41
In the Retail Field	42
Coming Motor Events	43
The Readers' Clearing House—	
Ford Valves and Engine Knocks	44
Garage with Gas Station and Battery Service	45
Wiring and Axle of 1914 Cadillac	46
Steering Gear on 1920 Monroe	47
Wiring on Owen Magnetic 1917 Model	48
Air Dymometer for Engine Tests	49
Boosting Accessory Sales	50
Getting More Out of the Shop	51
Squeaks & Rattles	52
Specifications of Trucks, Tractors and Passenger Cars	53

Index to Advertisers Next to Last Page

SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions	\$ 3.00 per year
Canada	5.00 per year
All Other Countries in Postal Union	6.00 per year
Single Copies	55 cents

Subscriptions accepted only from the Automotive Trade
Entered as Second Class Matter Sept. 19, 1899, at the Post Office
at Chicago, Ill., under Act of March 6, 1879.

SILVERTOWNS—

*Plus the Best Contract
the Dealer ever saw*

IT profits any dealer to be known as a Silvertown Dealer. To sell the tire of supreme quality, is a fine foundation for prosperity. The very name *Silvertown* carries with it a unique distinction among car owners. Silvertown singles out a dealer and his business.

But Silvertown is only one item of the Goodrich 1924 Proposition. The foundation of the contract, is a universal price to one and all contract dealers, backed by liberal dating during the winter, and complete price protection. A contract dealer knows that Goodrich gives him the best prices quoted anybody and nobody can purchase Goodrich Tires for less.

With Silvertown, the oldest and best-known tire, at record low prices—Commander Cord, challenger of low price competition—and Goodrich "55," a bottom-price, quality fabric,—a dealer baffles competition.

Don't sign any contract until you know personally what Goodrich has for you. Write the nearest Goodrich Branch for full particulars.

THE B. F. GOODRICH RUBBER COMPANY
ESTABLISHED 1870

Goodrich
TIRES "Best in the Long Run"

CHASE

DREDNAUT
Motor
Topping

"DEFIES TIME AND THE ELEMENTS"

You already know Chase Drednaut as the highest grade Motor Topping.

Not occasionally but *always*.

When you use Chase Drednaut Motor Topping there's no guessing how the top will look and wear.

You know positively

- that its appearance will be a credit to your skill.
- that the service it gives will build bigger business for you.
- that it will pay you a reasonable profit because most motorists know that "Chase" means *quality*.

Put an end to dissatisfaction by building **every** top of Chase Drednaut Motor Topping.

L. C. CHASE & CO., BOSTON

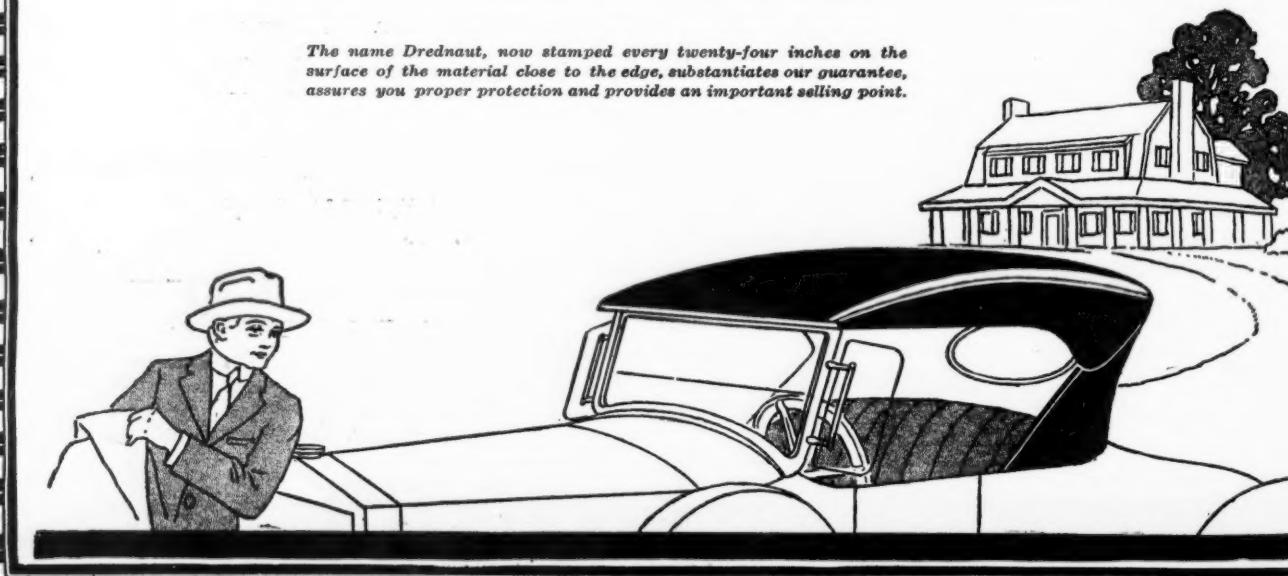
NEW YORK

DETROIT

SAN FRANCISCO

CHICAGO

The name Drednaut, now stamped every twenty-four inches on the surface of the material close to the edge, substantiates our guarantee, assures you proper protection and provides an important selling point.



INTEGRITY SERVICE


The more a man knows about Studebaker the more enthusiastic he becomes

**Read what former Sales Manager Harper
says in his announcement to the
Philadelphia public**

"I'VE been sales manager of The Studebaker Corporation of America for the past two years. I've lived in South Bend where Studebakers are built. I've learned to know the men who build them, and I've seen the way they build them. I've lived with the men who shape the policies of the House of Studebaker, and those men are my friends. I've been intimately associated with every phase of Studebaker development, and I know the integrity and honesty of everything that lies behind the product.

"And because the knowledge has proved to me that the product, the men, the policies, of the Studebaker Corporation are all sterling, and the Corporation above reproach, I've bought all the stock of The Studebaker Sales Co. of Philadelphia, and have acquired the honor of selling Studebaker Motor Cars in Philadelphia and vicinity.

"For twenty years I've been a part of the automobile industry, and never have I known a better product, a product more honestly sold, more solidly backed. Better motor cars than Studebaker cannot be built. ***"

The Studebaker Sales Co. of Philadelphia
H. B. HARPER, Pres.



THE STUDEBAKER CORPORATION OF AMERICA
 South Bend, Indiana

THIS IS A STUDEBAKER YEAR

POWER COMFORT

Nash Leads the World in Motor Car Value

Sullivan, Indiana, Reports on Nash Sales

Not long ago we cited the case of A. E. Anderson, Nash dealer in Princeton, Illinois, a town of 4000, who sold 43 new Nash cars between January 1st and November 1st of this year.

Now look at the figures for Sullivan, Indiana, with just 500 more residents than Princeton, Illinois.

The Sullivan-Nash Motor Company handles the Nash line there and they have retailed exactly 43 new Nash cars in the period ranging from January 1st to November 1st.

The point of the matter is, that given conditions approximately equal, Nash dealers will just about duplicate each other's business.

That speaks volumes for the popularity of the line and the salability of the cars.

If you're a dealer with a line your community isn't sold on—if you're a dealer who isn't sure his company is going to continue in business—if for any reason you're thinking of a change you had better wire us.

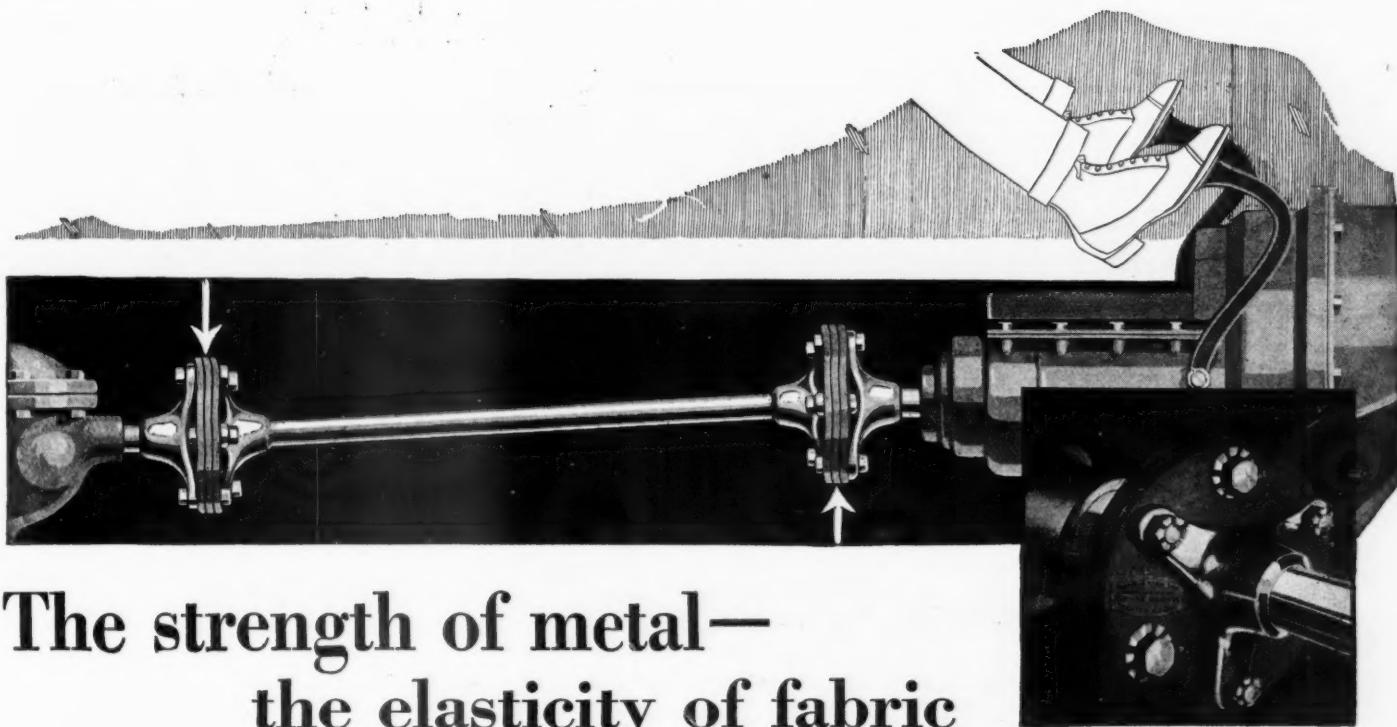
There are some fine Nash territories that can be had right now if you act promptly.

NASH

THE NASH MOTORS COMPANY
KENOSHA, WISCONSIN

Nash Leads the World in Motor Car Value

(2448)



The strength of metal—the elasticity of fabric

Fanwise Construction has made the Thermoid-Hardy fabric disc a practical necessity for motor cars

For years motorists endured the knocks, jars, and lost motion caused by the wear-down of metal universals. Delicate gears and bearings suffered irreparable injury.

Then the fabric disc was invented. Its flexibility cushioned the blows of starting, shifting, and bumping over rough roads. But not until Fanwise Construction was perfected did the fabric universal overcome every previous objection.

Balanced to meet every stress

Take a look at the diagram of the Thermoid-Hardy disc. It is built up fanwise, each layer overlapping and turned. The strands of each layer run in a different direction. Each sector is of uniform strength and elasticity. Every stress is balanced—

- the torsional, between the bolt holes
- the centrifugal, from the center outward
- the lateral, from the forward and back motion of the shaft

This holds the shaft in true on every revolution. It eliminates vibration and "whipping."

Now notice the diagram of the ordinary fabric universal. Built up so that only one driving bolt can pull "with" the strands of cotton—the other two tugging across them—your disc soon stretches out of shape. Vibration naturally follows, bringing jars and lost motion.

Only in the Fanwise Construction of the Thermoid-Hardy disc do you get the flexibility of fabric, the rugged strength of metal.

Thermoid-Hardy discs are now packaged for distribution through jobbers and dealers for replacement sales. Full information, prices, and discounts sent on request.

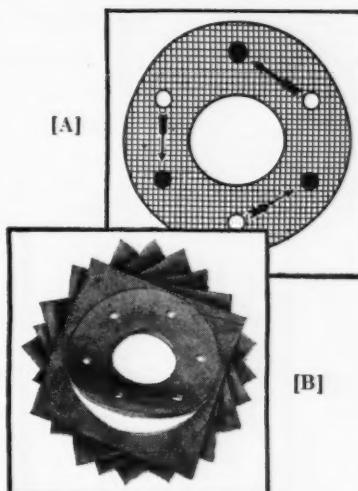
A book you should have

We have prepared a book, "Universal Joints—Their Use and Misuse," that treats the subject from every angle—the mechanical principles, construction, lubrication, manufacture, strength tests, and records of performance. Send for your copy today.

THERMOID RUBBER COMPANY

Sole American Manufacturers

Factory and Main Offices: Trenton, N. J.
New York, Chicago, Los Angeles, Detroit, Atlanta,
Seattle, Kansas City, Boston, Cleveland,
San Francisco, London, Paris, Turin



[A] Above is an ordinary fabric disc, its layers of fabric laid parallel. The three black holes are the driving bolts—the three white ones the driven. Note that the left hand driving bolt is the only one that can pull in the direction of the cotton strands. The other two must pull on a bias. This stretches the whole disc out of true, causing vibration and "whipping" of the shaft.

[B] Now examine the Thermoid-Hardy patented Fanwise Construction. The disc is built up with the strands of each layer running in a different direction. Each sector is equally strong, equally elastic. Every stress is balanced—the torsional, the centrifugal, and the lateral. This eliminates vibration and holds the shaft in true on every revolution.

THE THERMOID-HARDY UNIVERSAL JOINT

Makers of "Thermoid Hydraulic Compressed Brake Lining" and "Thermoid Crolide Compound Tires"

LIST OF USERS

Allis Chalmers Mfg. Co.
The Autocar Co.
Available Truck Co.
Barley Motor Car Co. (Roamer)
Chandler Motor Car Co.
Crow Elkhart Motor Corp.
Jas. Cunningham Son & Co.
Dart Truck & Tractor Corp.
The Dauch Mfg. Co.
Diamond T Motor Car Co.
Doane Motor Truck Co.
Dort Motor Car Co.
Fageol Motors Co.
H. H. Franklin Mfg. Co.
Garford Motor Truck Co.
Gramm-Bernstein Motor Truck
Hawkeye Truck Co.
Hendrickson Motor Truck Co.
Highway Motors Co.
Holt Mfg. Co.
Indiana Truck Co.
International Harvester Co., of
A., Inc.
International Motor Co.

Root & Van Dervoort Eng. Co.
Sanford Motor Truck Co.
Southward Fly. & Mach. Co.
Stevens V. Wagon Co.
Studebaker Corp.
States Mar Tractor Co.
Templar Motors Co.
Tioga Steel & Iron Co.
Townmotor Co.
Traffic Motor Truck Co.
Transport Truck Co.
Twin City Four Wheel Drive
Co., Inc.
United Motors Co.
Walter Motor Truck Co.
Ward La France Truck Corp.,
Inc.
Geo. D. Whitcomb Co.
Wichita Motors Co.
H. E. Wilcox Motor Co.
Willys-Overland, Inc.
Worthington Pump & Machinery
Corp.
Zeitzer & Lamson Truck &
Tractor Co.

Oneida Motor Truck Co.
Packard Motor Car Co.
Parker Motor Truck Co.
Patriot Motors Co.
Reliance Motor Truck Co.
Reo Motor Car Co.
Reynolds Motor Truck Co.

ELWOOD HAYNES, PRES.
C.C. CARTWRIGHT, VICE PRES.

ALTON G. SEIBERLING, VICE PRES.

A.E. STARBUCK, SECY. & TREAS.
MARCH HAYNES, ASST. SECY. & TREAS.

THE HAYNES AUTOMOBILE COMPANY

MANUFACTURERS OF



HAYNES
MOTOR CARS

KOKOMO IND.

ADDRESS ALL COMMUNICATIONS
TO THE COMPANY

Mr. Automobile Dealer:

The Haynes Merchandising Plan will help cut
80% of the waste out of your present selling methods.

Maybe this startles you a bit. Perhaps, while you realize that there is a waste in your methods, just as there is in every automobile dealer's business, you have not regarded it as a matter of great importance.

But I know I can show you where a tremendous percentage can be saved--transferred from loss to PROFIT--by adopting the HAYNES Merchandising Plan.

I know I can do this, for in talking with a number of dealers who have recently come to Kokomo to see me, I have not once failed to show them where they could make more money, much more money, through this Plan.

You want to make more money, I take it.

If so, don't delay, linger and wait. Don't hesitate, doubt, debate and argue with yourself, but GET THE FACTS FIRST and then decide.

I have the facts and figures here waiting for you. Wire for the plan.

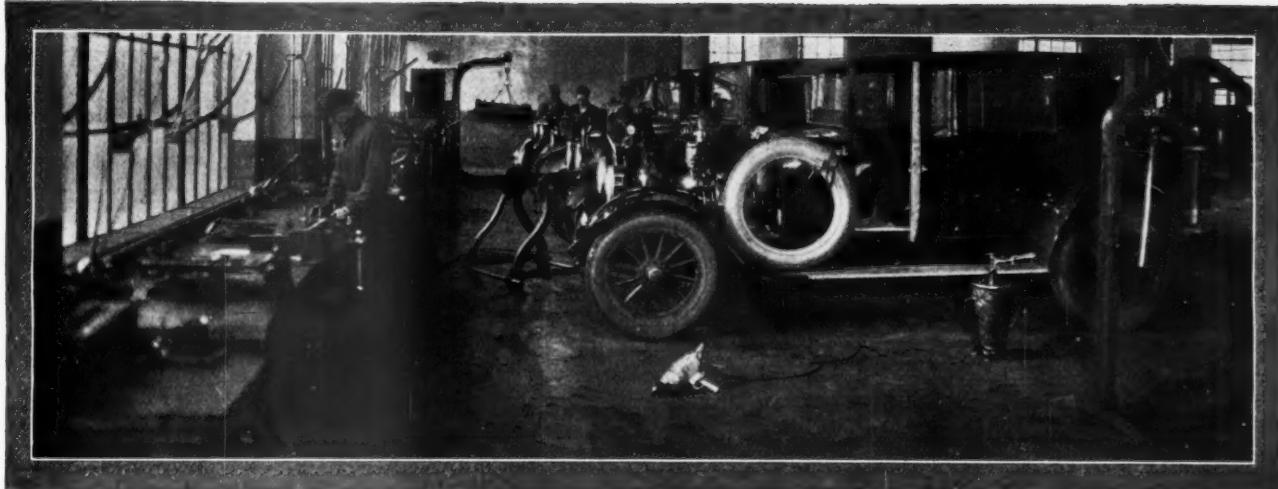
Yours for action,

THE HAYNES AUTOMOBILE COMPANY.



General Sales and Advertising Manager.

MOTOR AGE



Here is a picture taken in a well-equipped average shop. No machine tools are visible, because as mentioned in the accompanying article, unless the shop does a general line of repair work, the work is largely a matter of replacing old parts with new, requiring a certain line of equipment especially intended to speed up this class of work and do it more effectively and at a profit

Shop Equipment Direct Means for Making Greater Profits

Judgment in Buying Machinery and Tools in Proportion to Volume of Business Will Avoid Tying Up Unnecessary Capital. Better to Buy Useful and Necessary Hand Tools Before Machine Tools, Depending on Location of Shop and Character of Work Done

By B. M. IKERT

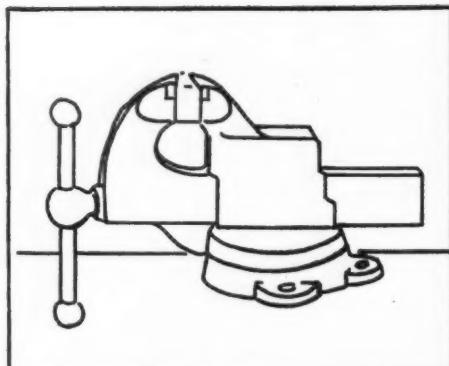
IN last week's issue of MOTOR AGE we dealt with the subject of shop equipment as a direct means for making greater profit. In that article it was pointed out that shop equipment is all important in the use of the flat rate system, that it makes for better and more accurate work; eliminates the "helper"; builds better shop morale and finally, makes possible the class of work demanded by a motoring public rapidly becoming motorwise, as to results at least.

Now as to equipping the automotive shop. There always comes up the question as to how much equipment the owner of the shop can afford to buy. He wants to buy the most equipment for the money, but in this we think a better plan is to buy such equipment that will be productive of immediate results. Equip-

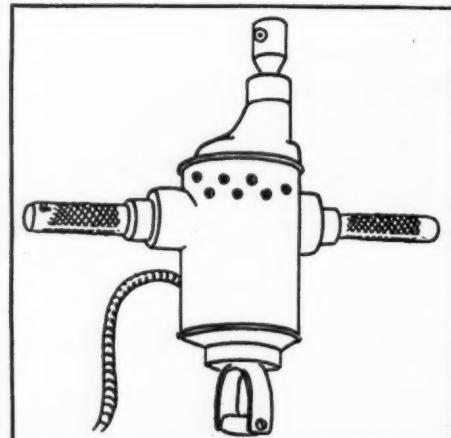
ment, in other words, which is necessary and commensurate with the volume of business at hand or which may be expected in the immediate future.

In tooling up the shop of the dealer's service and maintenance department naturally the location, size of community, potential business, number of cars, trucks and tractors and perhaps one or two other factors must be taken into consideration.

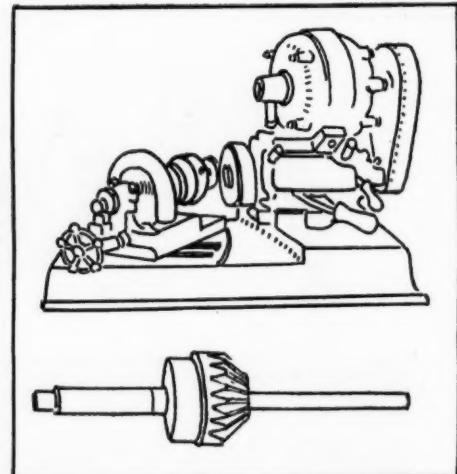
Also the kind and amount of equipment to buy must depend upon whether or not the shop expects to do considerable work on Fords. However, it generally will be found that any community in which there is justification for a well-equipped shop, or several such shops, there is a Ford sales and service establishment which normally can handle all the Ford work of the



The starting point of any shop is the vise. One with 6-inch jaws is a good size



An electric drill is a necessity; saves time and can be used anywhere



Valves are a big item in shop work. Reseating and facing tools are needed

community. For that reason, the matter of Ford equipment will not be taken up in this article.

When we give thought to the matter of equipping the automotive shop we must bear in mind several things. We must realize that the matter of servicing motor vehicles to a large extent has resolved itself into a matter of replacing parts. That is, instead of taking an old part and reconditioning it, we take it out and substitute for it a new part.

That condition has had an influence on shop equipment to the extent that today we find in a good many shops an absence of such machines as drill presses, lathes and similar machines which primarily are used to shape metal in the making and forming of new parts, or reconditioning old parts.

Instead of these machines we see more and more of a tendency to install apparatus to remove old bushings and replace them with new. More sets of reamers are bought to ream pistons for oversize pins, for reaming axles for king pin bushings and so on. We see a greater tendency for the use of speed wrenches and special tools to facilitate the tearing down and reassembling of engines and other units in order that the new parts may be replaced with dispatch.

We see more equipment purchased that will enable the mechanics to work more freely, such as the special horses to elevate the front of a car for getting at the engine bearings. A mechanic will do a better job and in much less time sitting in a comfortable position under a car than would be the case if he lay on his back under the car.

To this we must add the fact that many of the factories making cars and trucks have brought out certain equipment for their dealers to aid in the servicing of their vehicles. A general purpose gear puller, for instance, may do most of the jobs that might come in, but be of such a shape that it will not fit in a certain place on some make of car for which the car maker has brought out a puller to furnish the dealer.

A Good Line of General Tools

As a general thing it will be found that a good line of general purpose tools such as wrenches, reamers, wheel and gear pullers will cover the needs of most cars and trucks. If one studies, for example, the combinations of wrench sets gotten up by the wrench makers, he will find quite a bit of duplication. For example a wrench maker may have groups of wrenches for Fords, Overland, Maxwell, Studebaker, Dodge, etc., and a certain wrench may appear in each group.

Obviously if each set of wrenches covering the various makes were bought there would be a good many of one kind of wrench. A little discretion, therefore, in ordering such equipment will overcome any chance for duplication.

A mistake that has been made in the past by some dealers consisted in buying equipment for which there was no immediate use. Too often the mistake was made of buying an elaborate piece of equipment like a lathe or drill press, when

an electric drill, an arbor press, set of reamers and speed wrenches would have been vastly more useful and profitable.

We do not discourage the addition of the lathe or drill press in the automotive shop, but we do believe it should be bought at the logical time by the dealer's shop. The shop which is going to do an all-around repair business in a community more or less isolated from a large city, is justified in the immediate installation of a lathe and drill press and even a cylinder grinder, as is often done.

There seems to be no set rule as to what kind of equipment a shop ought to install. Frequently you will find that the former occupation of the man going into the automotive business will influence his buying. Thus, where you find a man who formerly was a machinist and now seeks to go into the automotive business, nine times out of ten he is interested in a lathe, drill press and similar machine tools with which he is familiar.

Replacement Tools the Thing

He knows that with this equipment he is equipped to make most any part and therefore feels he can meet the needs of any job that may come along. He overlooks the fact, however, that the business of maintaining motor vehicles to a large extent has become simply a matter of replacing old parts with new ones, as mentioned before.

There can be no question but what a lathe is a useful piece of equipment and many of the shops so equipped will tell you that while they might get along without the lathe, still it comes in very handy for a variety of work, principally in the making of bushings, trueing up crankshafts and similar jobs.

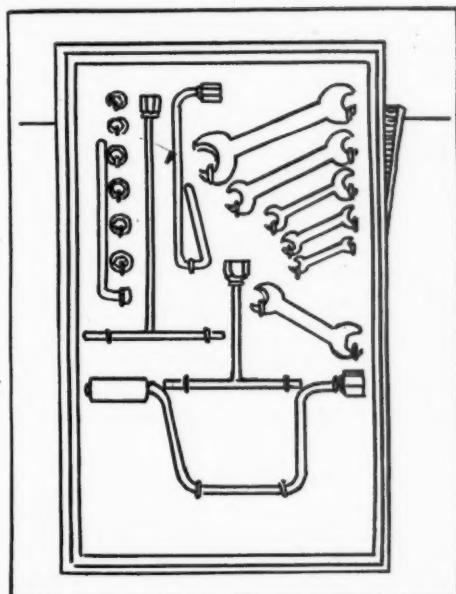
In the matter of a large drill press, there is more justification for the shop to install it as initial equipment. We refer, of course, to the back geared type of drill press either driven from line shafting or individually by electric motor. Drilling is and probably always will be one of the most frequently performed operations in the shop.

But even here, judgment must be used in equipping the shop. For instance, the automotive dealer about to fit out his shop and who has a certain amount of money to invest, will probably find it more advantageous to buy, first of all, an electric portable drill with a capacity up to $\frac{1}{2}$ in.

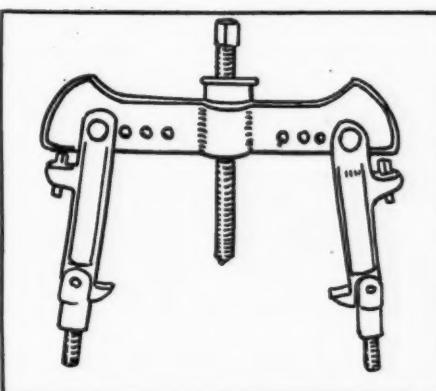
Most makers of such drills now furnish a bench stand so that drilling can be accomplished in much the same manner as with the conventional type of drill press. In addition to this we have the decided advantage of being able to carry the drill about and use it wherever necessary.

Logical Selection

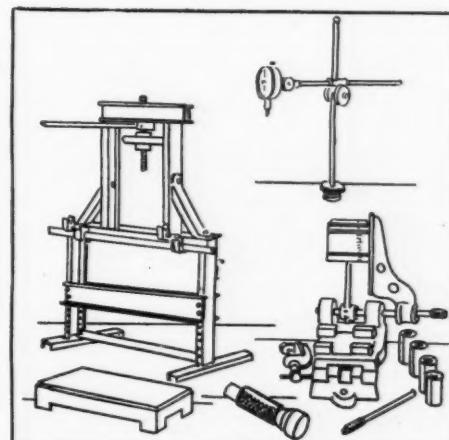
Naturally the man who has a certain amount of money to invest in shop equipment wants to buy it in the most logical manner. He may run through the pages of jobbers' catalogs



The biggest time savers in the shop are the special wrenches such as shown here



A gear and wheel puller is vastly superior to the old hammer and drift method of removal



An arbor press, piston jig, surface plate and similar tools are needed by every automotive shop

and see there many items of shop equipment which appeal to him but which, after all, are the things he should buy later on. A man easily makes the mistake of buying a few large pieces of machine tool equipment and then finds that his remaining cash is not sufficient to lay in a stock of the more needed hand tools.

If a man has a thousand dollars to spend for equipment it is far better that he buy a bunch of reamers, wrenches, screw plates, valve tools, electric drill, grinder and other things of that nature and forget for the moment about lathes, drill presses, engine stands, etc., much as we favor the latter equipment.

Suppose we assume that a dealer has available \$1000 or \$1500, for shop equipment, and wants to buy the tools and machinery in the proper sequence. He must, first of all, know something about his surroundings.

He ought to find out what his market is for the make of car or cars he represents in that territory. Then he ought to find out about the "orphan cars" in his territory. By such cars we mean those who have no dealers in that territory, or such dealers who are not prepared to sell a customer the right kind of service and maintenance.

The dealer must get a line on the farmers' business, the number of tractors available and trucks and it is not without reason to have him go after the business of keeping marine engines in order, providing, of course, he is located near a body of water where motor boats operate.

Analyze Prospective Jobs

With the right kind of an analysis the dealer should be able to get a pretty good line as to what he might expect to do in the future in the way of repairing and maintaining motor-driven apparatus and to that end he can plan and buy his equipment.

Where a dealer has sufficient funds available he no doubt will buy considerable equipment at one time, assuming for the moment that he has, up to the present, not done any great amount of service and maintenance work. He does not need to spend much time about buying equipment in proper sequence as does the man who has a limited amount of money to invest in tools and machinery. The latter must buy with discretion.

Let us assume that we have the case of a relatively small town dealer who has no equipment whatsoever. Let us further assume that he has shop space, has put in a bench, drop lights, shelves and a cabinet for tools. For general needs he will put in the following equipment and approximately in the order given.

1—Swivel Vise. The vise is probably the most useful and

needed piece of equipment. Buy it large enough. It should have jaws of 6 in. width or at least 5 in. width. The swiveling feature is not absolutely necessary but very handy and really adds very little to the cost.

For best results each mechanic should have a vise, although it is possible for the shop to get along for a time with only one vise. Perhaps a good plan is to get one 6-in. vise and a smaller one, say 3-in.

2—Portable Electric Drill. The usefulness of this tool is so well known that to go into details on it here would be superfluous. The $\frac{1}{2}$ -in. size is a good one and will take care of practically all drilling which the small shop will encounter. For best results the drill should be bought with a bench stand, whereby the drill can be used in much the same way as the conventional drill press. Unlike the latter, however, this arrangement preserves the portable feature of the drill.

If the dealer can afford it, it would be well to supplement the $\frac{1}{2}$ -in. drill with a smaller size, $\frac{1}{4}$ -in. The latter is lighter and handy for the smaller jobs, such as accessory installations, which often require the drilling of one or more holes less than $\frac{1}{4}$ in.

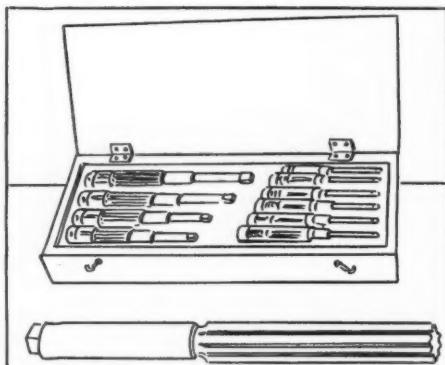
Some makers of electric drills furnish a grinding wheel arbor and stone with their drills at an extra cost and this is well worth considering. Such a grinding wheel will take care of the twist drills and other cutting tools, which need sharpening from time to time, until a bench grinder with two stones can be bought.

3—Valve Tools. Poppet valves are probably worked on as much as any other item in an engine and valve tools for refacing the valves themselves and reseating tools for the seats are essential. No shop can get along without them. Even if new valves are put in, it often is necessary to ream the valve guides and cut a new seat for the valves. There are both electric and hand driven tools for refacing valves and it is possible to get valve seat reamers with pilot stems of various sizes.

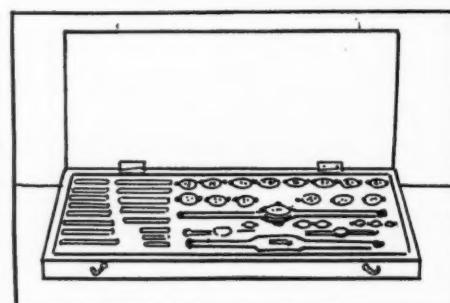
4—Wrenches. Speed wrenches, socket wrenches, open end wrenches and the like are the greatest time savers we have today when it comes to doing automotive repair work. No matter how inaccessible a nut or bolt may be, the chances are that there is a wrench to get at that nut or bolt. The speed wrenches, that is those shaped after the well-known brace, are useful in running on or off a nut rapidly. The T-handle wrenches come in handy when you have to set a nut "home."

A good plan is to buy a complete set of socket wrenches that covers every size of nut or bolt head ordinarily used in motor vehicles. This should be supplemented with a set of speed wrenches, including the T-handle and L-handle type. Of course these may be, and usually are, accompanied by two or three sizes of monkey wrenches and pipe wrenches.

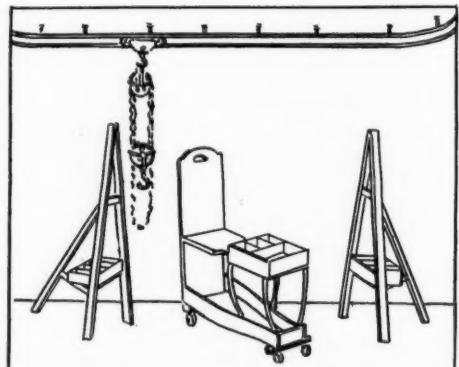
5—Gear and Wheel Puller. Very often these tools are furnished at certain cost to the dealer by the car maker. They are absolutely necessary and eliminate the chances of stripping



There is no end to the usefulness of reamers, both the straight and expanding types



Threads will get "jimmmed" and two sets of S. A. E. and standard screwplates are the answer



You must be able to get at the work easily. Hence, chain falls and overhead track will do the trick

threads or otherwise mutilating parts. There are on the market universal tools which will meet the needs of most cars and trucks and these should be bought even though the dealer has a set from the factory of the car he represents. His shop will be working on other makes of cars.

6—Combination Press. Much of the present-day motor car maintenance work consists of installing new bushings in place of old ones. A press in which the old bushings can be forced out and the new ones driven in must be available to do a real job. At the present time the market affords many excellent presses, which can be used for straightening parts and doing other work in connection with the bushing work.

In one case the maker has combined in a press a connecting rod and piston jig with a dial gage to test them, a brake lining jig, bushing removers and several other features. It makes an excellent all-in-one machine, especially since it is so built that more than one mechanic can work with it at one time, each doing a different operation, of course.

Where a shop wishes to put in separate equipment, however, it should include a straightening press for crankshafts and an arbor press with sufficient mandrels for all kinds of bushing work.

Along with this equipment must come a surface plate V-blocks, surface gage, dial gage, and micrometers, to test the work after it has been straightened.

7—Reamers. Along about this point we must turn to reamers. After we have forced in a new bushing it must be reamed to size. The best way to do is to install a complete set of expansion reamers and a set of straight reamers of the more or less standard sizes such as $\frac{1}{4}$ in., $\frac{5}{16}$ in., $\frac{3}{8}$ in., $\frac{1}{2}$ in., etc. The expansion reamers will take care of the sizes in between.

There is no end to the usefulness of reamers and while they are costly they soon will pay for themselves.

8—Combination Screwplates. Threads will become battered at times and need recutting. A brake rod may have to be made calling for a threaded portion for a yoke end and holes have to be drilled and tapped very often for the installation

of accessories. Therefore, the dealer should by all means include in his purchase of shop equipment a set of screwplates in both the S. A. E. thread and standard. Most of the bolts used in motor vehicle work use the S. A. E. thread and these sets are no more difficult to obtain from the supply houses than are the standard thread sets.

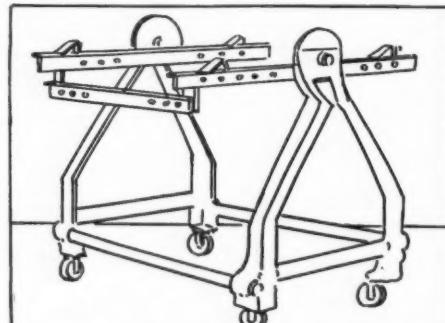
9—Overhead Track, Hoist and Horses. Being able to get at a job in a comfortable position is one of the greatest factors in making a shop efficient through conservation of energy on the part of the mechanics. A job of tightening connecting rod and main bearings can be done in half the time with the aid of a hoist and horses to elevate the front end of the car than is the case where a mechanic has to get under the car and lie on his back while doing the job.

Not only that, a better job always can be had when a mechanic can do work in a comfortable position. If an overhead track and hoist is not installed a shop crane should by all means be purchased. Some sort of hoisting apparatus is necessary for removing and replacing such units as engines, axles, suspending cars, etc.

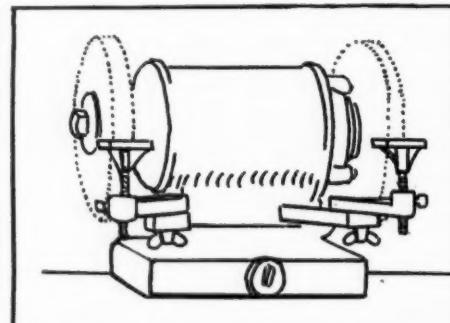
10—Engine Stand. Probably the greatest share of service and maintenance work is done upon the engine of a car, truck or tractor and in order to handle it properly an engine stand is almost a necessity. Of course, the shop can make a temporary stand of two-by-fours, but it never will approach the efficiency of the really excellent stands now upon the market. Most of these stands have universal features so that practically any kind of engine can easily be placed in the stand and worked on.

11—Electric Grinder. Sharp tools for accurate work is one of the first axioms of the machine shop. It is possible, of course, to get along for a time with the grinding attachment furnished with some of the portable electric drills, but a shop doing much work will not attempt to get along without an electric grinder having two stones. Aside from sharpening tools, a grinder is useful in dressing down parts or shaping material where filing would be too slow.

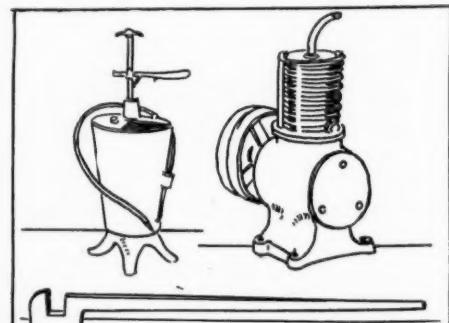
(Continued on page 24)



One of the best ways to speed up engine overhaul is by installing an engine stand



Good work demands sharp tools. An electric grinder like this does the work nicely



Three items you will have much use for, a grease gun, air compressor and straightening bar

The Broad Scope of Automobile Dealer Association Activities

By ROBERT E. LEE

Secretary-Manager, St. Louis Automobile Dealers' Association; President, National Association of Show and Association Managers.

I HAVE served as an association secretary for more than twenty years. I have been secretary of everything except the Bolsheviks and the bricklayers union. I am, I think, the dean of the Automobile Association secretaries. If then, I speak to you as Sir Oracle. Please either listen and learn or else bear patiently as with a superannuated association manager nearing his dotage.

After a study of the work of the secretary running over my twenty years, I have come to this conclusion, which is the crux of the whole secretarial situation, that a secretary's qualifications consist of 50 per cent service and 50 per cent personality.

The secretary who is merely a perfunctory sort of a fellow with none of the masterful influence which is required to control the opinions of men without offending them, is not a real secretary and he never will be in the true sense. In fact, I have long felt that the word "secretary," as applied to our duties, should be abolished and the word "manager" substituted.

What Is a Real Secretary?

This because too many are prone to think of a secretary as a routine bound clerk who keeps the minutes, when, in truth, to fill the position as it should be filled, he must be on a plane of mental equality with every man in his association and should have the implicit confidence of every member to the extent that that member will come to him as Father Confessor confiding his troubles and asking for advice.

The real secretary is a man of initiative, of leadership, a moulder of opinions and of the actions and of the business conduct, of those men who are in his association.

One thing I would like to impress upon everyone is my belief that the successful secretary will sink his own personality in order that the credit for things done by and through his association shall go to the president, the officers, the Board of Directors or the appointed committees. These men all realize that the burden of the work is done for them by the secretary. They are paying him a salary to do these things. The salary is his reward and the publicity should be theirs.

It is my belief that it is part of the duty of every secretary or manager of an association to assist those of his members who are ambitious for public preferment, in every way possible. I have put my shoulder behind the wheel a great many times in St. Louis for men in this organization and at this moment

"SERVICE" A Secretary's Slogan

By Robert E. Lee, Manager

ST. LOUIS AUTOMOBILE DEALERS' ASSN.

Serving so as to bring the Best to the Most.

Earnest attention to ethical teachings and practice.

Research for information of trade value.

Versatile handling of a multiplicity of problems.

Intimate touch with public officials, affairs and organizations.

Capitalizing every opportunity to benefit your industry.

Esteem, confidence, friendship of E and mental equality with your members and your town.

worth anything to a member it is worth paying well for and no successful organization can be conducted on cheap dues.

One thing that an association manager must learn is that a secret is a secret. If he has the confidence of his principals at all he will learn their financial situations, that they are being pressed for money, that their home affairs are not happy and a thousand other things about them, which he must not pass on to competitors.

In addition to his actual duties in connection with the work of his association, I think that the officers of an association should encourage their secretary to have an active part in the civic affairs of their town. He is best fitted to represent them in the Chamber of Commerce, in the various civic improvement associations, and through them he acquires close touch with city officials and state authorities, which can be of tremendous value to the members of the association.

Know the Public Men

I have made a point to be on the most intimate terms of friendship and socially acquainted with the Mayor of my city, with the License Commissioner, the Street Commissioner, the Building Commissioner, the city editors and the reporters of all the newspapers and even the Chief of Police and the Chief of Detectives. There is nothing which is reasonable, that I ever ask of any of these men that I do not get, whether it be for my organization as a whole or some courtesy for an individual member.

I believe it is one of the paramount duties of every automobile association secretary to take an active and earnest part in conserving the highway safety in his city. I need not say that every accident between automobiles, which causes a fatality or an injury, is a direct sales resistance for automobiles. With this in my mind, I have become vice-president of the St. Louis Safety Council and attend all its meetings. I am also chief of the Traffic Vigilantes of St. Louis which has a secret membership of 350 Vigilantes watching out for and reporting traffic violations.

It is needless to say that a competent secretary must be able to write readable newspaper stories so that the activities of his organization may be known through the press and the better written the story the better and more effective is the publicity result.

I have always made it a point to be more than ordinarily courteous to factory men who come to St. Louis seeking dealers, also to visiting country dealers and

The Worth of a Secretary

No association can be run without money and no association manager can be such in the true sense unless he receives a salary sufficient to justify him in devoting all of his effort, his cleverness, his tact and his industry to the betterment of the industry which he represents. Therefore, if an association is

even to that awful pest, the inventor of the stop light which turns over five times and then whistles.

In going into some of the internal activities of the office of the automobile secretary, I necessarily must use the St. Louis association to illustrate. There we have an Advertising Censor Bureau.

The woman who is soliciting advertising for a church program is politely sent by the dealer to the office of the secretary. The secretary, who is politeness personified, tells her that her proposition must be submitted to the Advertising Censor Committee and that he will answer her at 10 o'clock the next day. The secretary is himself the committee, and when she appears next day for her answer, she is told apologetically and with extreme sorrow that the fool committee refused to sanction her program.

We maintain in my office a list of those salesmen and mechanics who have been found crooked, incompetent or unreliable. The dealer calls my office to inquire if I know John Smith and I refer him to John Smith's former employer for the facts of his crookedness or incompetence. This plan has weeded out of the St. Louis market more than 100 of these fellows in the past two years. They cannot get a job in this town.

A Regular Bulletin Service

I maintain in my office a regular bulletin service. I tell them to close on the Fourth of July and Christmas and Memorial Day. I tell them of the new legal decisions, of dangerous practices in the trade, of threatened license raids by the police and of the hundred and one other things which come up in any town in a year.

Once each month I issue a bulletin of used cars sold during the previous month, the facts being gathered from the dealers. This report shows all the cars of each make sold in St. Louis, who owned them, and who they were sold to, with their addresses. This gives the dealer the opportunity to correct his mailing list and to offer his service station to the new owner of the used car.

Another used car report which I issue once a month is gathered in the same way from the dealers and it shows the price at which all used cars are sold during the previous month, the various makes of cars being grouped together and their several body styles being separated so that a man can tell, for example, how many 1917 Oldsmobile touring cars were sold during June and the price received for each. It is a used car valuation plan.

Another monthly list, which is secured from the Secretary of State and issued to members, is the number of new cars delivered or licensed during the previous month from St. Louis. They say that comparisons are odious—and they are—but comparisons are also very valuable in inciting the dealer whose mark is low in sales, to extra effort to catch up with his nearest competitor.

Twice each year I make a confidential

census of the number of new cars and new trucks and the number of used cars and used trucks held by St. Louis dealers with their cost value. This has proven to be of wonderful assistance for statistical purposes and it has been shown to bankers to prove to them that the market is not overstocked, because the comparison with the previous six months and the previous year is given in the report.

I find my service called for frequently to settle disputes between dealers or to smooth out the untruthful or unethical statements made by salesmen about competing cars. I have never yet failed to bring about harmony.

I maintain in my office a list of all the automobile licenses issued and answer the telephone possibly forty times a day, through my staff, for this kind of information.

Four Kinds of Meetings

We hold four kinds of meetings of our association. Every other Thursday there is a round table meeting, which is for executives only. There they are free to talk things which they could not talk before their salesmen. Occasionally we have educational meetings with lectures on salesmanship or other topics. About once a month we hold a night meeting to which our salesmen and salesmen are invited and once or twice each year we hold a Pep meeting to which the whole trade is invited and at which we have talks by important men and entertainment.

All of these meetings are at luncheon or dinner, for I have found that a man is more tractable, more able to reason, more good humored, more a real man at the dining room table. I have also found that no man can break bread with another and go out the next day and do him a dirty trick.

One thing I never neglect, that has done much to endear the association to its members, is that if one of my members is ill or has had a death in his family, I always send flowers to his home with the best wishes of the association written on the card. I do this also when new concerns open for business. The expense is considerable but it comes back a hundred fold in good will.

I do secure some positions for salesmen although I do not conduct a regular employment bureau, but I endeavor to bring prospective employer and employee together whenever I can.

The Source of All Information

There is no question that is put to my office over the telephone or otherwise, that is not answered either instantly or a little later on. We have come to be an encyclopedia of automobile knowledge and there are many other things asked of us which we always answer. One man asked me, so that he might include it in a speech, how to find the quotation: "Am I My Brother's Keeper?"

I believe that the automobile association secretary ought to be mixed up in

everything that happens in his town as the direct representative of the automobile trade. Personally, I belong to the Advertising Club of St. Louis, to the Chamber of Commerce, to the City Club, and to the Better Business Bureau. Whenever anything comes up in any one of these organizations, connected with the automobile business, I am the man to answer their questions and I am the man to do the job if one is to be done.

I do not hesitate to get up at 3 o'clock in the morning to start an automobile or a record run to some other city and I am the fellow who tips the newspapers off the next day to the fact that the record was broken.

I am on the Mayor's traffic committee, which has to do with the recommendation of traffic rules and laws to the Board of Aldermen. I had a hand this spring in framing a new automobile traffic code for St. Louis.

I am the fellow who recovers from the Police Department all the lost dealers' license plates and I return them to their owners, getting the credit which rightfully belongs to the poor policemen who found them.

Now a resume. What should an association manager be?

He must be an ambassador qualified to settle the trouble in Soviet Russia. He must be a diplomat. He must have individuality, tact and cleverness. He must possess wisdom to a large degree. He must be able to handle any sort of a situation. He must have persuasiveness. He must have the ability to make a good speech on the shortest possible notice. He must have the ability to write well, either letters or newspaper stories. He must be the kind of a man who can meet on even and equal terms, the biggest man with whom he comes in contact. He must have ability to arbitrate and settle or smooth out a quarrel between the dealers. He must have the knowledge to advise in business or love, marriage or finances, pneumonia or the mumps.

Now, if he has all of these qualifications, if he is that sort of a wonderful fellow, why in the hell shouldn't he be paid a real salary?

DEPARTMENT STORE SOLVES PARKING PROBLEM

A NEW way of relieving traffic congestion in downtown districts is being undertaken by Woodward & Lathrop, a Washington, D. C., department store.

Free bus service is provided for patrons who cannot leave their own cars near the store because of the parking regulations. A 25 passenger bus travels continuously from 9:15 a. m. to 6:00 p. m. over a route covering sections of the city where unlimited parking is permitted. The route and eight regular stops have been widely advertised in Washington newspapers.

How Constant Potential Was Discovered at Mudville

A Story of Things As They Might Have Been; a Tale of Two Systems

By A. H. PACKER

"**I**'VE got the low down on the whole story," said Abe, as the alley gang gathered around the stove. "Them thirty-seven engineers down at the Lightning Electric Co. didn't have nothing to do with it, except to steal the scheme from Hank Myers down at the filterin' plant, and here's how it all happened."

"Mudville, as most of you fellows know, is in the center of one of the most fertile counties around here, but at all the farms they have trouble with the water. Doesn't seem to matter whether they get it from wells or streams, it all seems to have a fine deposit of mud or silt in it, so that filters have to be used. Most of the folks around there use those cheap filters where the screens are spot welded in, and that's where the trouble starts.

"After those people use their filters for three or four months, the screens get so thick with mud that no more water comes through, and then they have to take them down to Hank Myers who has the only clean water around those parts. Hank does all the filter cleaning with some sort of chemical that dissolves the mud, his clean water, a good pump and a big gas engine to drive the pump. He's learned a lot of course in doing that sort of work for a good many years, and the electrical engineers have learned a lot from Hank.

Money Lost on Series Cleaning

"The first scheme he had was to connect all the filters up in a string and run the same stream of water through

them, but right away he got into trouble. Seemed as if his engine would only run right at about one speed, and that made the pump produce a pressure of about 110 pounds. Then when he hooked up that much pressure to two or three filters, it raised Cain generally, and sometimes tore the screens loose, so he had to cut down on the pump some way.

"Hank then got a valve to use in the pipe line, and found that he would get the best results if he had 7.5 pounds pressure for each filter in the line. It took Hank a long time however to find out why it took so much gasoline to run his engine when he was getting so little work done. He finally figured it out though, and found that he was generating about four times as much pumping force as he needed and was then throwing three-fourths of it away again, wasting it in getting the water through the valve.

"That wasn't the only trouble either, for when another filter needed connecting on the line, he had to shut down and disconnect somewhere to get it hooked in—same way when a customer called for one. Then he found that some of the folks around there had large filters, some had the small size and some the middle size. If he turned on the water to suit the large filters, he was in danger of damaging the small ones, and if he cut it down for the small ones, it took him about four days to fix up the big ones.

"All of these conditions made Hank get busy. Sometimes you might see him

scratch his head and think—sometimes just scratch. Finally he had a bright idea. The old pump had to go, but the gain would be worth the sacrifice.

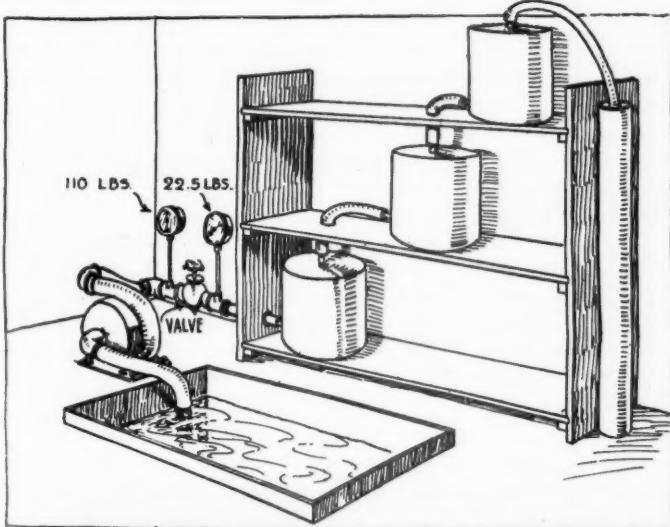
Hank Decides to Change His Piping System

"All of the filters whether large or small, seemed to need 7.5 pounds pressure to get the chemical through properly. Of course at this pressure, a large filter could take a heavy stream of the chemical, while the smaller ones would take less, but the new scheme to be worked out depended on giving them all the same pressure, so Hank decided to change his piping all around and get a pump that would send a large stream at low pressure.

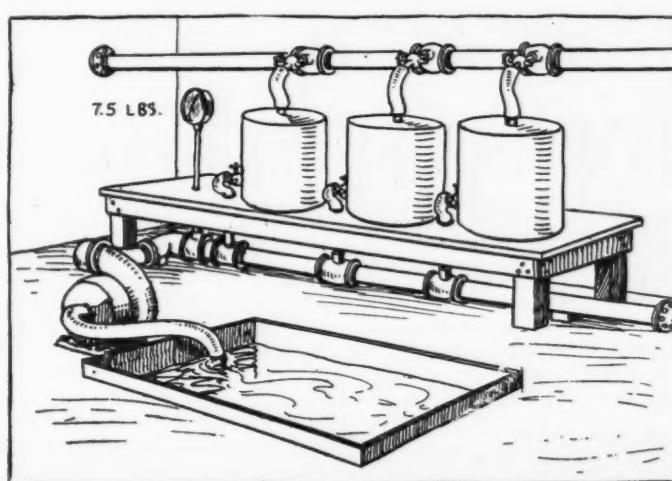
"When it was all ready and in operation, Hank found it did all he had figured on and then some. He just connected it to his charge and discharge pipes, turned the stop cocks in the pipe line connections, and let it take what it wanted. Then his gasoline supply stayed by him much longer than before, for his engine no longer had to generate a lot of water pressure that was afterward thrown away.

The Sulphated Filter

"Only one case gave Hank any trouble at all, and that was when some careless filter owner, would let his filter stand with the screens all coated with sediment, until it had hardened. Then there was a chance that the stream of chemical going through would be held



Hank ran the same chemical through all of the filters but had to use a valve that wasted about 80 pounds pressure



Hank decided to change his piping all around and get a pump that would send a large stream at low pressure

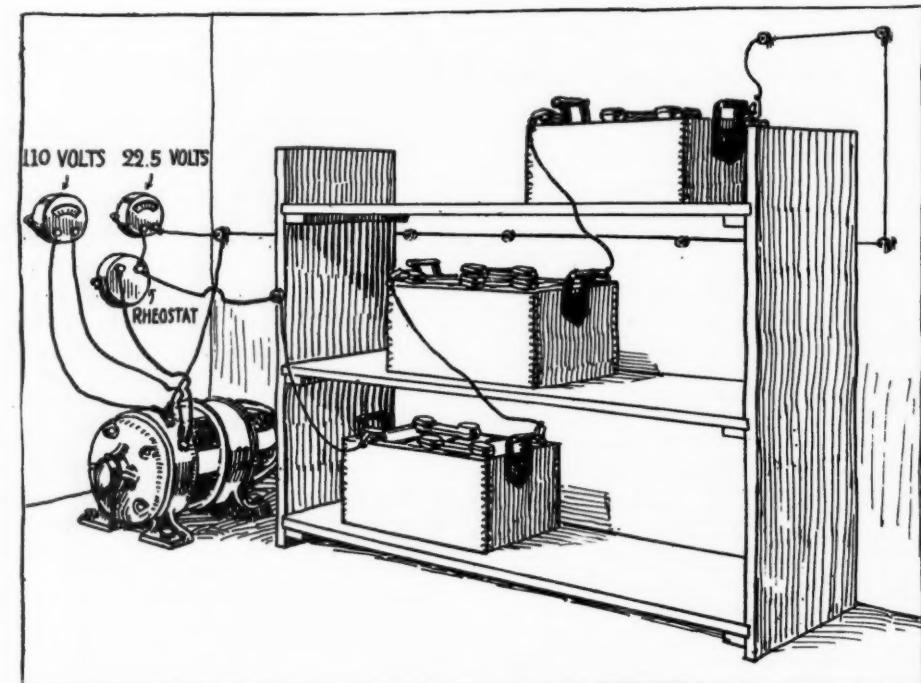
back in some places, and rush through in others, sometimes breaking the screen wires loose and destroying the efficiency of the filter.

"But Hank even licked that condition, for when he checked up a filter and found it sulphated (hardened) he would connect it as usual, but in the connection would hook up a small tube which he said was a resistance, for it let the chemical go through, but slowly. In this way the sediment on the screens would have time to soften up.

Later Hank would take out the small pipe and let the flow be heavier.

"Now it may seem peculiar, but the battery stations around here seem to have made some of the mistakes that Hank did, but perhaps you can't blame them so much, for they had to use what they could buy in the shape of charging equipment.

"The old timers used to have a 110 volt generator like Hank's pump, and throw away nearly eighty volts in order to use the other twenty or so, without hurting the batteries. Of course once in a while they would have about the right number of batteries in the shop at the same time, to make it possible to make a little money, but most of the time, they were losing money and didn't know it.



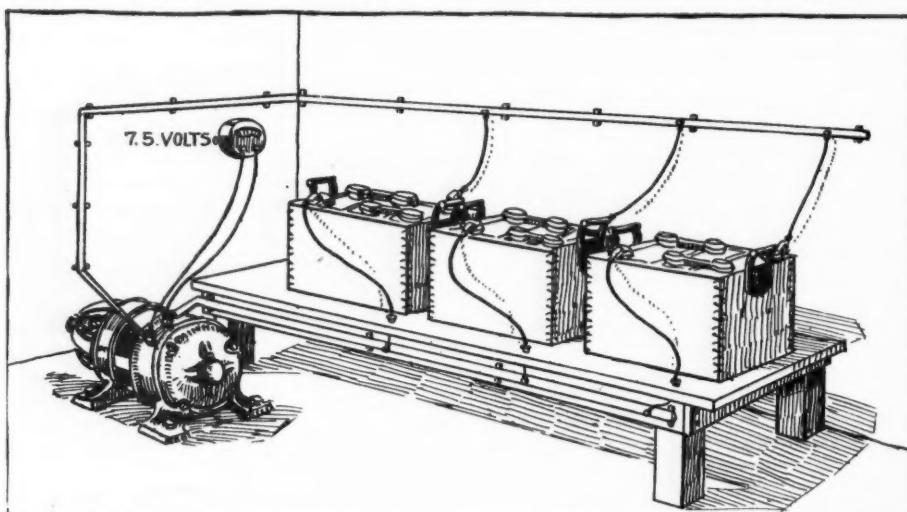
The battery stations made the same mistake Hank did and wasted a lot of electrical power in a rheostat

"Then they had the same troubles Hank did, for when a customer came in either to leave or get a battery, they had

to shut down in order to cut a battery into or out of the circuit. With the small batteries and the big ones they had again the same problem for some needed a charging current three or four times as strong as the others did.

"And now look what's happened—they have stolen Hank's invention, call it Constant Potential or something fancy like that and hook up the batteries the same way Hank had the filters. They have even stolen the scheme he used for the filters with the hardened sediment on the screens, for with a sulphated battery they put in a coil of baling wire so that the flow of current will not be too strong at first.

"But the greatest surprise comes in the reduction in time that makes it possible to charge a battery in about eight hours where before it took several days, and when a fellow wants his battery charged in a hurry—and he's always like that, and when it takes three days at one place, and eight hours at the other—puzzle—where does he go?"



Then they stole Hank's idea, used wires and batteries instead of pipes and filters, and called it Constant Potential

23 Years Ago This Week In Motor Age

(From MOTOR AGE of Dec. 19, 1900)

Publisher's Note

Beginning with this issue the publication day of the MOTOR AGE is changed from Thursday to Wednesday of each week. (It has since been changed back to Thursday.)

Stunts Are Not New

A successful attempt to run a gasoline vehicle 1000 miles without stopping the engine was recently made at the Crystal Palace track, London. The track is one-

third of a mile in circumference, splendidly banked and of cement, so that the conditions were favorable * * *. Two vehicles started, the larger one having 8 horsepower and the smaller 5 horsepower. The carburetor of the larger vehicle became quite frozen during the first night, and compelled a stoppage. The smaller vehicle went through without the motor being once stopped, although on two occasions the vehicle had to be brought to a standstill for attention to the tires, the engine running the whole while, and the 1000 miles were com-

pleted in 48 hours, 24 minutes and four seconds.

Nash's Predecessor Gets Started

The firm which is to occupy the old Sterling bicycle plant at Kenosha, Wis., and manufacture automobiles therein will be known as T. B. Jeffery & Co. Mr. Jeffery was one of the partners in the famous firm of Gormully & Jeffery, absorbed some time ago by the bicycle trust, with which Mr. Jeffery parted company a few weeks ago. Associated with him will be his son, Charles T. Jeffery, who designed the machine now made at the Rambler factory and who has made a careful study of motor vehicles for three years or more.

Young Tom Socks It Home

In Which We Introduce the Oldhams, Sr. and Jr., Runwell Dealers in Bangor and Witness the Injection of a Little New Life Into the Shop

By JAMES V. MALONE

I.

THOMAS W. OLDHAM was an automobile dealer—just an ordinary, every-day sort of fellow, as totally unromantic as anything ever was and a man who disliked the hurry-up-go-and-get-it type of person as much as he disliked salty ice cream. He had always been a hard worker, a plunger who seldom missed his shot and now, after some fifteen years in the automobile business, he pointed with pride to his generous bank balance where all doubting Thomases might see just what a man who was willing to stick to the tried and true processes could do with automobiles.

Oldham had grown up with motor cars. He had serviced the first one brought into the state of Iowa. His vision had told him that here was a thing which was going to make many men rich and so he determined to get in, not on the ground floor but in the basement and work right up. It had taken considerable pinching at first but the reward had been great. He had given his children a modest but pleasing home and when the oldest girl married, Oldham smiled his approval on the young man for he too, was a plunger.

Then there was Thomas, Jr., who, because his father was a worker who accomplished things, went through college in the east and now his home coming was scheduled as the biggest event in old Thomas' life. The boy and he had had a talk some months before and it was decided that Thomas, Jr., would be taken in as a partner in the Runwell Auto Sales Co. of Bangor. Thomas, Jr.'s record as an athlete, but not much of a scholar, was known to all, but the older Oldham figured that the lad was not interested in Latin and Greek but would be interested in automobiles—it would come natural with him.

Thomas, Jr.'s first day in the office of his father started with many smiles and handshakes but ended with the lad looking a bit glum. When his father tried to detect the cause of the sad look, Tom smiled again and assured him that it was nothing.

A week passed during which time, Tom made a thorough examination of the shop, working a bit here and there on a car or tool and occasionally grabbing the broom and sweeping over the floor. Needless to say, the staff of grease specialists gasped a bit at the sight of the lad in overalls and blue shirt, greasy and spotted and with a broom in his hand.

"Old Thomas is sure bustin' him in right," commented one of the men, "but the darned funny thing about it is that the lad seems to like it and here I thought he was one of them Sheik guys when he floated in the other day."



"Old Tom did not see the smile of satisfaction that crossed his son's face as he reached for the door and closed it quietly behind him"

Young Tom mixed well with the men and at the end of the week, there wasn't one who didn't think he was the "cat's ankles," which is what they say about a mean jazz band. If the men only knew it, old Tom was as puzzled as they were by the young man's sojourn in the shop but on Sunday morning the lad came into his father's office with several typewritten papers in his hand and his jaw set for an argument.

"Dad," he said, after he had settled himself in one of the easy chairs, "I've a report here that I'm going to read to you and which, as the junior member of our firm, I wish to have some action on. You remember when I was home for Christmas and we had the talk about my going into things here? Well, when I went back, I stopped in St. Louis, Chicago, Detroit and New York and looked over things there a bit. I also made stops in those cities on the way back and that accounts for my being three weeks late getting here."

"What I learned in that short time was well worth learning, as you will see by this report, but let me read it to you and you will see for yourself."

Old Tom passed his hand over his face to conceal a smile. The kid was going to tell him something. Well, well—a chip of the old block, all right—a wide-awake plunger.

"All right, son," he said, lighting a long cigar, "shoot if you must."

Young Tom adjusted the papers and began.

What Is Wrong With the Shop

1.—The Tools: Too old-fashioned for efficiency or good work, interfere with

hiring of good mechanics because good men to-day require modern, quick working tools. Complete, new outfit must be had for the shop before the name of Thomas Oldham, Jr., can be printed on the same card with Runwell Auto Sales Co. of Bangor."

"Now, see here, son," old Tom interposed, good-naturedly, "I rather had an idea that maybe that was what you was poking around in the shop there for—I saw it when you had that waiting-at-the-altar-look on your face when you first went through. Now, I know that my shop isn't equipped like places in the cities you mentioned but this isn't Chicago or New York or St. Louis—it's little old Bangor and you know the natives hereabouts number not more than twenty-five thousand. They're all good folks and they all like me and the Runwell car and the way I've treated them."

"I've built my business on honesty and there isn't a man in all of Rover County who wouldn't loan me his last penny, I've—"

"Dad," the young man's voice was stern, "I expected this. Now let me tell you something: I know this is not Chicago or New York and I know that my dad's record here is clear and clean as crystal but the Runwell car that you sell here is exactly the same in every detail as the ones sold in Chicago and New York and the people here have ears and eyes and hands, pretty much like the ones I saw in those towns, even if there are fewer of them."

"Contrary to general opinion, Bangorites or Bangorians or whatever they are, are not hicks and dumbbells, they're people who know what they want and when

they want it. I'm not going to tell you about the ones who have been driving to neighboring towns for their automotive supplies and repairs, but they've been doing it, and the reason is, dad, because you have not been doing things to suit them. Now let me continue this report, uninterrupted and I'm sure I'll point out a few things to you that you haven't seen."

The older man did not smile. Apparently, some of the things his son had said had found room in his mind and he centered his gaze on the papers in his son's hands. Young Tom continued:

"The new tools needed will cost close to two thousand dollars—"

"My Gawd!" howled the older man, "two thousand dollars, son—what on earth are you thinking of—two thousand dollars—that's enough to bury fifteen people with military honors or pay the interest on the Allied debt for four years. Two thousand dollars! Why that'd buy a half interest in the Ford company, wouldn't it? Holy smokes boy, go easy. You read that as smooth and nice as if you were asking for a second piece of pie at dinner—oh, man, two thousand dollars!"

Young Tom laughed. "Dad, I knew that was going to be an awful jolt and I'm going to tell you that you've got a record for making Lincoln read his Gettysburg address from each penny before you let it go and it's said that you even tried to take the blanket off one of the Indians one time, but don't worry—you'll not have to buy those tools—do you think I can come in here for a half interest without spending some money?"

"Boy, I know I've got Bill Cody backed off the map when it comes to huntin' buffaloes," Old Tom said, "but the buffaloes I hunt come on the backs of

nickels and I know how to skin 'em and get the most out of them. This here about you spending some money makes me laugh—where you going to get two thousand dollars?"

"What difference does it make, just so I get the tools?" young Tom countered and went on with his report:

"I have prepared a list of the tools which will be needed and their prices.

"Engine lathe complete with all attachments, about \$500.

"A 20 inch column drill press, about \$100.

"Portable forge, about \$40.

"Emery wheel stand with 8 inch wheel, about \$50.

"Arbor press, about \$85.

"Vises and work benches, about \$200.

"That will cover the heavier equipment and get close to \$1,000 in cost."

Old Tom settled deeper into his chair. "Son," he said, "I've got an arbor press out there and vises and work benches and they've served me well for a long time. Now, is it absolutely necessary for me to install those new things? I'm going to let you in on a secret or two. The shop has not been making money here lately and I've been letting it peter out because I need that space for storage and new car display. I'm going to try to do away with the heavier work and just do small jobs."

"You think that's a secret, dad?" asked young Tom. "Why anyone with eyes could see that that shop is not making money and my plan is to make it make money. You can't let it peter out, if you do, you'll peter out with it. Make up your mind to accept that as the truth, an automobile dealer without a shop is like the beer that's sold now—no kick in it and it can't last—either it is going out altogether or it is coming back full strength. WE are not going out!"

There was a silence and young Tom knew its significance was greater than anything his father could have said. He was really shaking the old man into seeing things and the screwed-up appearance of his forehead told that there was a mental fracas on within.

"I'm going to throw those pieces of equipment into the alley, dad," the younger man continued, "I know that they've served you well all these years but candles and kerosene lamps served well until gas and electricity were discovered and put to use."

There was another silence and young Tom braced himself for his final shot. "If you want me as your pardner, dad, then we are going to do things right. We are not going to continue as half-past automobile dealers or service men. We are going to adopt the new methods and keep up with them. We are going to re-vamp this old-fashioned waltz business of yours into a snappy fox-trot. We are going to advertise, push, sell and make it go, the faster the better. We're going to be transportation merchants and we're going to make the Runwell car the best liked one in Rover county. We're going to make automobile dealers all over the country look for our next move. Trade paper reporters are going to hound us for our stuff and if we slip now and then on a stunt, we're going to go back and do it right and quit grumbling and growling. If you still want to skin the buffaloes on the nickels, you'll have to get some new, modern, time and labor saving machines to do it with—otherwise, count me out!"

Young Tom rose and walked to the door. His father sat, still staring at the desk before him. He did not see the smile of satisfaction that crossed his son's face as he reached for the door and closed it quietly behind him.



Here is a most unusual arrangement of filling station, sales, service, and accessory departments. The shop is at the left end and the car salesroom at the right with accessories between. The fronts of the shop and the salesroom are placed at an angle of about 45 degrees to the street or about 90 degrees to each other, the space between being taken up with the filling station and accessory store.

MOTOR AGE is of the opinion that the two display rooms would have offered a better display had large pieces of plate glass been used in place of the small panes but, of course, it would have been at the expense of the general effect and that is valuable as well as visibility.

It will be noted that there are no garage entrances to break into the uninterrupted expanse of glass.

A Tire Business Built on—Personal Contact—Right Treatment—Location—Special Advertising—and It Pays

The Story of Leonard C. Sleep, a California Tire Dealer Who Sells Nothing But Tires and Tire Repairs, Never Cuts the List Price on a Tire, pays All Overhead From His Shop and Did a \$60,000 Business Last Year

HERE is a tire dealer in California who, starting with a capital of \$1,500, all borrowed, eight years ago, did a gross business of more than \$60,000 last year. He does both a cash and a credit business, but he never carries more than \$2,500 in charge account on his books at any one time, and in the eight years he has been in business, he has lost barely \$400 in bad account, most of these losses due to death and the moving out of the community of the persons to whom he had given credit.

He sells nothing but tires; his repair and re-treading department pays all his overhead. He never cuts the price on a tire, whether he sells the customer one or twenty tires, the price for each tire is that suggested by the manufacturer.

What's in a Name

This dealer is Leonard Sleep—and no one is allowed to forget his name, for his advertising carries the line, "When You Are Ready to Re-Tire, Go to Sleep."

People connect re-tiring time and Leonard's last name, and he figures that that one line has brought him as much business as all the other advertising—and he is no piker in telling the world about his wares—which he has done. The community which he serves is the Rockridge district, midway between Oakland and Berkeley. This community extends in an irregular circle for about a mile in all directions around his store, and there are 5,000 automobiles in this community.

Sleep knows every owner's name, and



Leonard C. Sleep, as he stepped out of the repair shop to talk to a correspondent of MOTOR AGE. Sleep believes in WORK as the main factor in selling tires

last year he had 1,500 of these 5,000 car-owners for customers. In fact, the keynote of Sleep's business, which is far from somnolent, is strict attention to his own territory, and the ironclad rule not to take in more territory than he can serve.

He is a vigorous, young fellow, this re-tiring Sleep, who looks as if he might have stepped out of the line of a varsity eleven. In his own opinion he has no new methods of merchandising; he merely sells tires, because he has the

tires to sell and that is his business. He told me the story of the development of this business, which he carries on with the help of three expert tire workmen, and no salesmen, as we sat in his small salesroom on College avenue, and this is what he said:

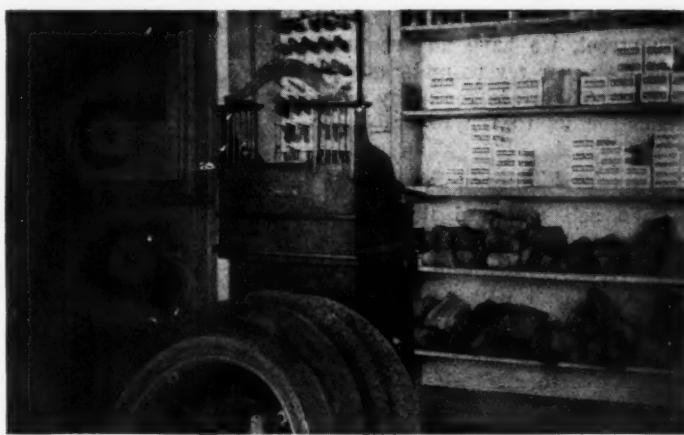
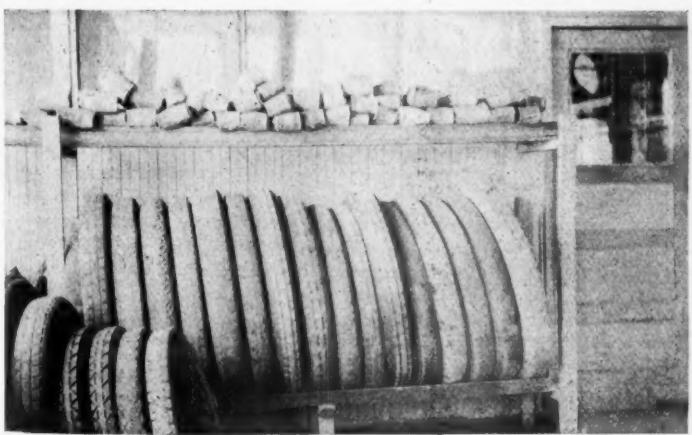
Sound Business Basis

"The tire business, my share in it at least, is built on four things, personal contact, right treatment, location, and special advertising. Since the drop in prices, tire sales have increased, but it did not require the reduction to make business good. My greatest enemy in the business, as it is the greatest enemy of every other tire dealer, is the mail order house, which floods the market with poor tires and thus cuts into the sales of the dealer who sells lines of proven worth and value.

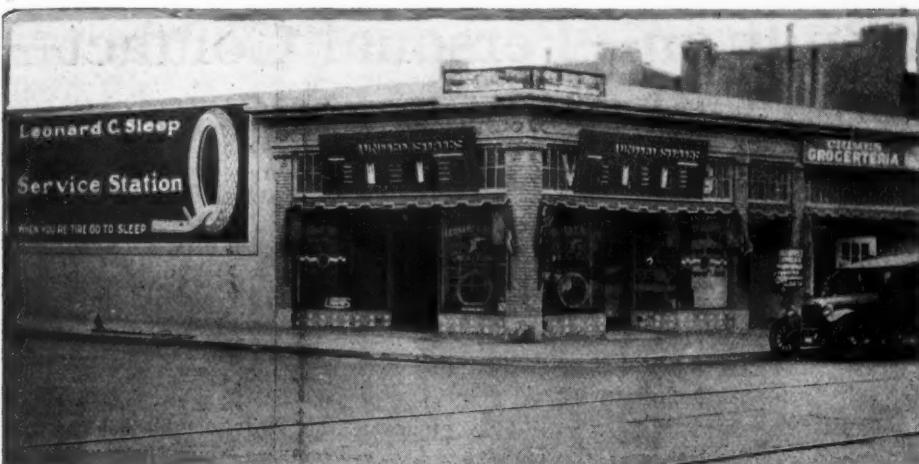
"Sooner or later, the automobile owner finds that the mail-order tire cannot compete with the standard tire, even at half the price, and he goes back to the regular dealer, but, in the meantime, the dealer has lost business.

Some Effective Sales Methods

"I confine my solicitations for business, and the majority of my advertising, to the territory in the center of which I am located. There are 5,000 automobiles owned in this district, and I have a list of all of them, with the names and addresses of their owners. When a man comes in I know just what kind of tire he should have as soon as I have



Through the little cash register in one corner of this small tire shop, \$60,000 passed last year. The salesroom itself is not more than 20 feet square. "Too many dealers," says Sleep, "tie up all their money in stock. I buy as many tires as I can sell right away, and no more. That cuts down space and overhead"



Leonard C. Sleep's salesrooms and shop, where nothing is sold but standard tires, and nothing repaired but tires. It is in the Rockridge Community midway between Oakland and Berkeley, California

glanced at his name and the description of his car in this list.

"I employ no salesmen, and I send out no circular letters. The first do not earn their salaries, and the second are thrown in the waste-basket. I have tried both, at high cost and small returns, and I have settled down to special advertising in the local newspaper, which, in this case, is a weekly, which everyone in the Rockridge district appears to read.

Uses Special Advertising Only

"I do not do either general or continuous advertising, but when I get a special lot of tires, a new and improved tire, or anything else which has special selling merit, I can and do sell it out quickly with special advertising of that one thing. In my opinion, too many tire men try to serve too much territory, and waste too much money on general advertising, which does not get general results, and is just as apt to make business for a tire dealer ten miles away as it is for the advertiser.

"Transient business does not pay, in the long run, and I give little attention to it. Of course, the tires are here, and our signs say so; if a man passing stops to get a tire, we sell it to him, and sell him the right tire at the regular price. But we make no effort to stop him on the street, we have no cut price sales, and we never try to undersell the other fellow. There are too many service stations for us to try to catch the transient.

Standard Tires at Standard Prices

"We sell standard tires at standard prices, and we devote our attention to getting customers who live in this district and who will be permanent. We keep these customers by treating them right, and when you treat a man right in a sale, whether it is a spool of thread, an automobile, or a tire, that man cannot quit dealing with you.

"Advertising in the local newspaper has made the Rockridge Tire Company, and my name, synonymous with tires, and

last year 1,500 of the 5,000 automobile owners in this district not only bought their tires from me, but brought their repair and re-treading jobs to me as well. Community advertising has built up a reputation for square dealing, standard tires, and quick and permanent repairs. I do not follow the new car buyers, but merely add their names and description of each car which comes into the district to the list I have mentioned.

And Personal Contact

"I make it a part of my business to be in the shop at all times. There are three men in the repair department, one of whom can take my place if I have to go out, but I make it my business to establish and maintain personal contact with every man or woman car owner who comes in. Even though they buy nothing, they go out with the impression of courtesy and service—and when they

do want to buy something, THEY COME BACK TO THIS PLACE FOR IT.

"I will not cut the price of a single tire to make a sale, because, in the first place, price-cutting helps the other fellow, and I am in business for myself, not for someone else.

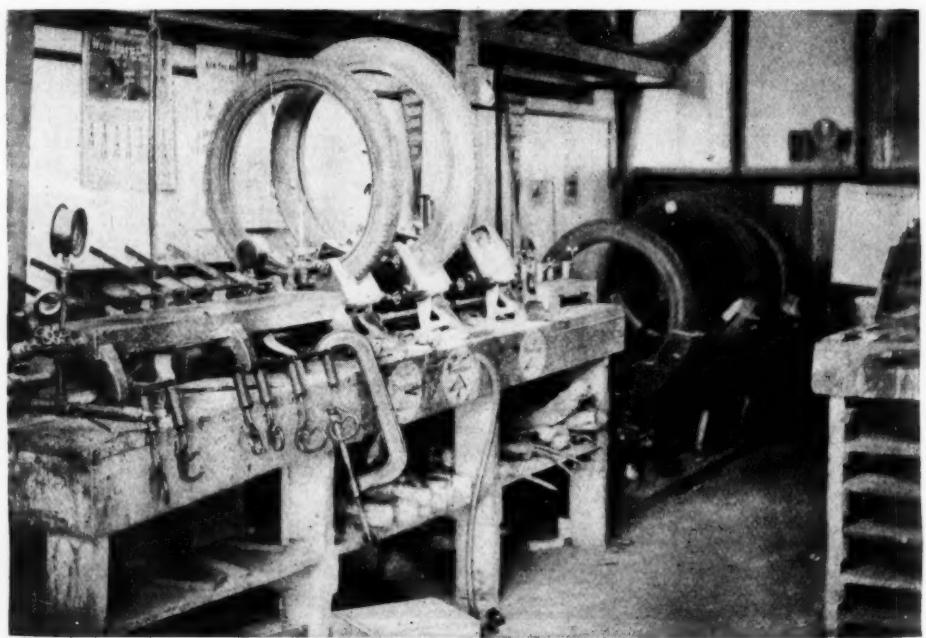
"One morning recently a well-dressed man called here to have a tire re-treaded. I introduced myself, as I always do, learned his name, noted his car, and supervised the job. I did not know this man's business, but three days later I got an altogether unsolicited and unexpected order for ten tires from one of the largest engine-building companies on the coast, for cars used by its salesmen. This company is located some seven or eight miles from my shop, out of my territory. I learned later that the man whose tire I had re-treaded is one of the big officials of the engine company.

"Treat 'em All White"

"The way I treated him got me the sale of ten tires, and the way I handled the order for the ten tires will keep that company's business. 'Treat 'em all white, and they'll stay with you,' is the foundation stone of any business, and tire selling is today the merchandising of a necessity, not a luxury.

"I don't mind telling you that when I started in this business, I borrowed fifteen hundred dollars to start with. Last year, the gross income at this little store and shop was more than \$60,000. This year, if business continues as good to the end of the year as it has been the first nine months, the income will be around \$70,000.

"Location has something to do with this. The automobile dealer can locate on a side street; the tire dealer must be out where everybody can see him, on the main stem, because his name and the immediate connection of that name with the filling of a need for a tire, must be



The moulding and vulcanizing department in the Sleep repair shop. This shop paid all the overhead on a gross business of \$60,000 in a community of 5,000 automobiles, in 1922

maintained in the minds of the people who live in his community.

"I have not attempted to do an all-cash business, but in the eight years in which I have been selling tires, I have lost less than \$400 through bad accounts, and this loss was due largely to death and to the removal from this part of the country of some of those to whom I had extended credit. During the war period I have carried as high as \$8,000 in charge accounts, but have now reduced this to approximately \$2,500, and shall not allow it to go higher than this.

Shop Pays All Overhead

"The repair and re-treading branch of my business pays all my overhead."

"There are three men working in this shop for me, and I work there myself. In fact, I find that it pays me large dividends to be everywhere, in the salesroom, in the shop and in the office. Eventually, it seems to me, the tire man will devote himself exclusively to tire merchandising, with an effective tire-service department, rather than attempt to mix the sale of tires with the sale of equipment, gasoline, oil, automobiles, or anything else. I keep a small truck busy on phone calls for tire service and nothing else, and find it one of my best methods of advertising, as well as an effective means of giving service.

"The day of the tire business in the garage is fast passing away; people who have consideration for the service for which they pay want tire experts, just as they want battery experts for their batteries, and engine experts for their motors, and not jacks-of-all-trades fooling with their tires.

What's Wrong Here

"The whole tire business, however, is not yet legitimatized, and the rubber makers and the tire manufacturers are largely responsible for this condition. The man who goes into the business of selling shoes, hardware, automobiles, or almost any other form of merchandising, must invest his capital in that business, yet a man, even though he knows nothing about tires, or selling them or repairing them, can go to a rubber manufacturer and, with \$100, lay in a stock of tires. Then he can, and most usually does, give away his profits to get the trade started his way.

"When he wakes up after this period of cut-price selling, he finds that he must slough off whatever tires he has as rapidly as possible to get money enough to pay what he owes the tire company. Thus he unloads the balance of his stock at what he can get for it, undersells the regular established tire man and, in some cases, puts the real tire merchandiser out of business.

Standardize Prices

"Prices of tires, it seems to me, should be standardized and stabilized, the same as the prices of new automobiles, with the factories fixing the prices, and compelling the dealers to adhere to them. The tire distributor should be done away



Sleep considers this tire-repair and service truck one of the most effective pieces of advertising he has developed. He says that the slogan—"When You Re-tire, Go to Sleep" makes users of tires remember him and his business

with, unless he conforms to price-stabilization, for the majority of the tire distributors are price-cutters who, at the same time, are willing to cut the throats of the dealers who refuse to make price reductions and who endeavor to maintain one price for their tires.

"Tire districts should be established for each dealer, just as automobile dealers have their districts. If the first dealer to take over a district does not succeed, let another dealer take his place, and so on. Why not put the tire business in the same stable condition, in this regard, that the retail automotive business occupies? The result would be better for the automobile-owner, better for the tire dealer and better for the manufacturer. Yet the manufacturer must take the first step, if this condition is to be brought about.

Up to the Manufacturers

"The makers of standard tires should put a fixed retail price on their tires and refuse to sell them to a dealer who cuts that price. The dealer who cuts prices on standard tires injures the whole tire-selling industry, because he

implants a feeling in the mind of the buyer that there must be something wrong with the tire if this dealer can and does sell it at a price below that at which other neighboring dealers are selling the same make and grade of tire.

"In my opinion this is the greatest drawback to the tire business today and the greatest handicap to the retailer of tires."

Sleep has just purchased a lot between College avenue, on which he is now located, and Bryant street, in the same community in which he now is, and is preparing to erect thereon a building for the exclusive purpose of selling tires. He will handle tires only, no other equipment, and not even gasoline and oil, though he will supply free air and water.

He believes in the separation of the merchandising of all the by-products of the automotive industry, and is convinced that only by this method of handling can the retail tire business be put on a firm footing. His eight years of success along this line would indicate that there is good practice as well as theory in his point of view.

DAN'S DIARY

DEC. 20—Gee you ought to a seen the swell christmas present i got for my girl. Gosh i been saving up for about a month and i aint got it all paid for yet but that dont hurt.

It didnt used to be very exciting around a garage around Christmas time but this year between the old man rushing in winter bizness on us and us selling Christmas packages to a lot of wimmen to give to there husbens i aint had a day of all fall me thinking gee they is some disadvantages in being bizzzy.

A lot of them wimmen is like little kids, they come in and get a spot lite and want us to put it on for them but

they dont want it put on till Christmas eave or during the night just like sandy claus done it. Gee wouldent i make a hit going around with a little red cap and white whiskers on all night Christmas eave fastening accessories on busses when every body eltsie was having a swell time with Christmas trees and parties and eveything specially if the man should hapen to see me and take a crack at me with a automatic or a shot gun him thinking i was a auto thief trying to pick his ignition lock.

Nix not for me ill put on faltse whiskers and go over to my girls house and hand out presents to the kids but i dont wanto be no automotive sandy claus, not unless they brings there busses around to the shop in the afternoon.

Keeping Down the Upkeep Cost Through Service Bulletins

SERVICE Talks For Autocar Owners" is the title given a series of bulletins regularly sent out to its customers by the Autocar Co., Ardmore, Pa. In getting together this service information the Autocar company states that an analysis of thousands of repair orders shows that 75 per cent of the average mechanical upkeep expense is directly due to three factors:

- 1—Lack of intelligent lubrication.
- 2—Failure to tighten loose nuts and bolts regularly.
- 3—Overloading and overspeeding the vehicle.

With this in mind, the text of the service bulletins is written to the end that owners will pay more attention to the things which spell longer life to the entire vehicle.

The company stresses the point that the amount of the repair bill is directly under the control of the vehicle owner because the amount of work needed is in the exact ratio to the care the vehicle is given. The Autocar company in its various branches impresses upon its customers the importance of periodic visits to the service stations where an inspector will advise them as to the work needed to keep the truck in the best condition.

On all new vehicles sold and brought regularly to any of its branches each week for the first four weeks the company drains the crankcase, washes the interior and refills with new oil, without cost either for the oil or labor. This is done to impress upon the customer the importance of regular draining of the crankcase and also assures the careful treatment a new vehicle should have.

Service talk for Autocar owners

Protect Your Investment!

THE purchase of a motor truck involves a sizable money investment as well as a liability for future expense and maintenance.

Why not commence now to protect the money invested and bring down upkeep and maintenance to the minimum?

An analysis of thousands of repair orders shows conclusively that 75 per cent of the average mechanical upkeep expense is directly caused by:

1. Lack of intelligent lubrication.
2. Lack of regularly tightening loose nuts and bolts.
3. Overloading and overspeeding.

Therefore, if these three essentials are regularly cared for, you will have only one-quarter of the normal mechanical upkeep expense. Periodical visits to your service station, and having trucks lubricated, tightened and inspected, will assist mightily in accomplishing the desired result.

"A stitch in time saves nine"

When you make your periodical visit to the service station, the inspector will advise you as to any necessary work. Have this done at once. Neglected repair work increases rapidly in cost. The amount of the repair bill is directly under your control because the amount of work needed is in exact ratio to the care you take of the truck. A truck properly maintained will last many times longer than one that is abused and neglected.

Protect Your Investment!

—Reprinted from the August 1923 issue of the "Autocar Messenger"

The sturdy Autocar
Wherever there's a road

Service talk for Autocar owners

"The first 1000 miles are the hardest"

"If your motor truck could speak up for itself, its first words would very likely be,
"The first 1000 miles are the hardest."
—G. B. Tolman, Service Engineer

E
VERY piece of machinery, no matter how well manufactured, needs a certain amount of careful "breaking in." The custom of overworking the newly acquired motor truck, both as to speed and loading, is much too prevalent. Upon the manner in which the new truck is driven and cared for during the "breaking in" period depends very largely the life and service satisfaction to be derived. Improper "breaking in" methods invariably result in unsatisfactory operating service and unnecessary and excessive repair expense. For best results we recommend the following practice.

1. Drain engine crankcase every week (for first four weeks); wash out with good light machine oil; and refill with proper engine oil. After fourth week repeat this operation every two weeks.
2. Never operate truck in excess of one-half government speed until engine is thoroughly "broken in."
3. Never load truck beyond overall rated capacity.
4. Have all adjustments checked and corrected at every filling of crankcase.
5. Have all nuts and bolts tightened at regular weekly intervals.

"A stitch in time saves nine"

NOTE: On new Autocar motor trucks brought to any of our branches regularly every week for the first four weeks of operation, we will drain, wash out and refill the crankcase with new oil, without any charge for oil or labor.

—Reprinted from the November 1923 issue of the "Autocar Messenger."

The sturdy Autocar
Wherever there's a road

Service talk for Autocar owners

Effective Brakes are Good Insurance

Properly designed brakes, if kept in good working order, greatly reduce the collision hazard and assure safety in traffic for both the driver and the motor truck.

T
HE brakes on a heavily loaded motor truck are under very severe service, and for this reason the best brake lining will wear rapidly and adjustments must be made at frequent intervals in order to maintain effective brakes. The Autocar motor trucks are equipped with powerful brakes, in the design of which special attention has been given to make the adjustment for wear an easy matter for the truck owner. Instruction in adjusting brakes will be furnished free of charge by any Autocar Factory Branch or Service Station.

"The brakes should be tested each day. Before going half a block from the garage make a service test by throwing out the clutch and applying the brakes. If possible, select a dry spot for making this service test. Under no circumstances should the truck be taken farther if the brakes are not operating properly.

Drivers should keep the brakes adjusted properly. Brakes should not drag, nor be too loose; loose brakes do not act quickly enough.

The brake lining used for Autocar brakes is the best obtainable for the purpose, but under hard service it will wear rapidly and should be renewed when it is no longer possible to take up this wear by adjustment.

Always have an experienced mechanic install brake linings. He should be sure the lining is properly stretched to avoid wrinkling. The rivets should be properly countersunk; otherwise the metal of the rivets will score the brake drum and the brakes may not hold properly. This work will be handled quickly and in a workmanlike way by any Autocar Factory Branch or Service Station.

Oil or grease on the brake lining will destroy its effectiveness. This oil or grease may get on the lining from carrying too much grease in the rear axle housing or on the rear wheel bearing. Keep the grease level in the axle housing down to the overflow plug. Use the grease gun on the wheel bearings regularly but moderately.

To apply brakes properly when on the road—when coming to a stop on the straightaway, shut off the throttle and leave the clutch engaged until just before you come to a stop, thus making of stopping especially desirable in wet weather because it lessens the tendency of the truck to skid. It also helps to distribute the braking power evenly and assists the action of the brakes. Do not shut off the ignition until after you have stopped; it may be necessary to make a quick start.

In going down an ordinary hill, leave the clutch engaged and close the throttle. This helps cool the engine, and also makes it unnecessary to use the brakes.

In going down steep hills or when descending ordinary hills with a heavy load, put the gears intermediate or low speed at the top of the hill and leave the clutch engaged.

—Reprinted from the September 1923 issue of the "Autocar Messenger."

The sturdy Autocar
Wherever there's a road

Engineering for the Service Man

No. 8

What the Toggle Joint Does in Brake Adjustment

[Reprinted from November 29, issue with cut numbers corrected.]

ADJUSTING the carburetor is sometimes a case of try this little screw and if that doesn't make the engine run better, then try some other little screw. In the case of brake adjustment we sometimes think that shortening the pull rod will make the brake work better. Perhaps it will, but usually it will not.

To know the construction of anything, whether it be a brake or an engine is the first step in being able to repair or adjust it intelligently and the adjustment made from an understanding of the construction is a satisfactory job two ways. First the mechanic is sure of himself and satisfied the job will be right and second the customer will be satisfied because the job IS right.

Internal brakes are often operated by means of the construction shown in Fig. 1, where toggle arms serve to spread the band and make it hold against the brake drum. The pull from the pedal is transmitted to the brake rod, and from it to the brake lever. Here the force is increased, due to the ratio of distances in the lever from the top pin down to the pivot, and from the pivot to the thrust arm. The thrust arm transmits the thrust to the toggle arms, which in turn expand the band.

What an Understanding of Brake Construction Does in the Shop

Where the value of knowledge of brake construction comes in is really in an understanding of toggle joint action and how it increases the applied force, at the same time decreasing the motion available. And here it may be well to note the general law that, in using gears or levers or any other scheme of varying mechanical force, the gain in force is always offset by a loss of motion. This can be seen in an ordinary lever where the long end moves through the greater distance but the short end can exert the greater force.

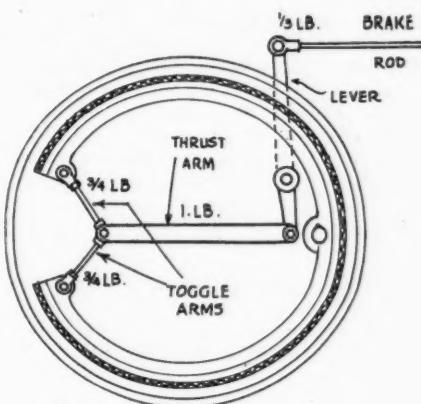


Fig. 1
Internal brake with toggle arms adjusted so that brake does not hold well

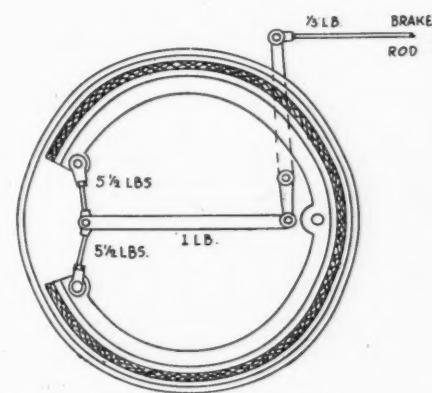


Fig. 2
Internal brake with toggle arms adjusted so that force tending to spread the band is much greater

Keeping this rule in mind we will now consider the brake condition shown in Fig. 2. Here we have the same general layout as shown in Fig. 1 but the toggle arms are much shorter so that the action is quite different. To determine exactly what the action would be, we can make

an experiment or consider the action that would take place in Fig. 3 if we had a weight supported between two pulleys as shown, and held in the air by rope going over the pulleys, with two other weights, one at each end of the rope.

This is an experiment you can easily make and if a 1-pound weight is used in the middle and two $\frac{3}{4}$ -pound weights used at the ends, the weights will assume a position approximately as shown. If you should pull the center weight down, it will rise again to this normal position, and if you lift it, it will settle again.

When in a position of rest, it is certain that there must be an upward force supporting it and that this force must be equal to the weight. However there is no actual rope going straight up from the weight, so that the effect of the two ropes going off at an angle must be equal to an upward force of 1 pound.

If we consider that the pulleys turn very freely so that there is no appreciable friction, then the $\frac{3}{4}$ -pound strain put on the rope by the end weights will be transmitted over the pulleys to the portion of the rope holding the center weight, so that the two $\frac{3}{4}$ -pound forces going off at this angle have the effect of a 1-pound force acting upward.

This relation of forces can be figured by drawing a parallelogram as indicated in the sketch, using lines of any convenient length. The sides of this parallelogram will then be proportional to the forces acting in their direction while the diagonal will be proportional to their resultant, or combined effect.

Changing the Rope Experiment to See How Force Is Multiplied

Referring now to Fig. 4 we have quite a different condition, for the end weights have been made much greater. They will then raise the center weight until, by our parallelogram of forces, the 1-pound force can serve as a diagonal, while lines corresponding to $5\frac{1}{2}$ pounds

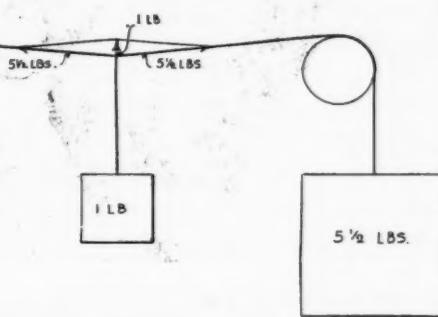


Fig. 4
To maintain a wider angle between the supporting ropes greater weights are required at the ends. This illustrates the action of Fig. 2

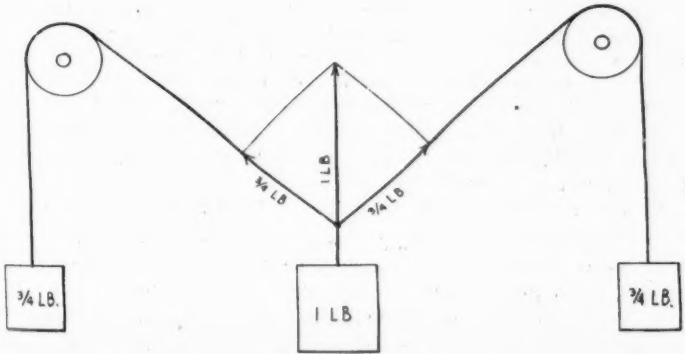


Fig. 3
Rope and pulley experiment that explains the forces acting in Fig. 1

serve as the sides. The system will then again come to rest for the two forces of $5\frac{1}{2}$ pounds each act at such a divergent angle that they only produce a 1-pound effect in an upward direction.

Now, if we go back to our toggle joint construction in the internal expanding brakes, we find that this same rule about the forces can be used to figure the leverage we are getting, about the only difference being that we are pushing instead of pulling as was the case with the ropes. In Fig. 1 we assume that, at the brake rod, there is a pull of $1/3$ pound which, by a three to one ratio in the lever, is increased to a force of 1 pound in the thrust arm. With the angle shown between the toggle arms there will be only a force of $\frac{1}{4}$ pound in each arm,

this being similar to our rope illustration of Fig. 3.

Suppose now that we should shorten the toggle arms of Fig. 1 until they would take a position as shown in Fig. 2. We would also have to lengthen the thrust arm of course, or else have a different position of the lever, but this does not affect our illustration. We will still assume a $1/3$ pound pull in the brake rod which is again changed to a 1 pound force at the thrust arm. The angle however, is now quite different from what it was before so that our one pound thrust, instead of producing a force of $\frac{1}{4}$ pound in each toggle arm, produces a force of $5\frac{1}{2}$ pounds in each.

Quite a difference, without pressing any harder on the brake pedal or chang-

ing the length of the brake rod.
Why Shortening the Brake Rod May Not Cure Brake Trouble

On a job of this kind the complaint might have been that the brakes did not hold well. If the rod should be shortened, it is more than likely that the brakes would drag when the car is running, because shortening the rod is about the same as putting a light pressure on the pedal, and holding it as you drive.

The illustrations of Fig. 1 and Fig. 2 are somewhat exaggerated to show what really happens, but they also show that, where the brake did not hold, a change in the toggle arm length might be made to make it hold better, without any danger of half applying the brakes or making them drag.

(Continued from page 12)

12—Grease Gun, Air Compressor and Straightening Bar. A large grease gun ordinarily called a garage grease gun is vastly superior to any other means for quickly getting lubricant into rear axle housings, universals, etc. Lubrication of chassis units is a frequently performed operation in the shop and the immediate purchase of a grease gun will prove a good investment.

The shop with compressed air not available, is not complete. Aside from being able to use the air for tires, it can be used for blowing out fuel lines, cleaning parts, cleaning cars and chassis for painting and spraying paint by means of an air brush.

If you haven't a straightening bar, how can you handle a twisted front axle? These steel bars are inexpensive and yet the handiest things the shop can possess. You may not need one very often, but when you do—well, you just have to get one from somewhere, that's all.

In the preceding list of equipment we have, of course, assumed that attention has been given to the purchase of the common hand tools, such as hammers, files, screwdrivers, a blow torch, hacksaws, and the variety of other tools common to all shops. It also must be remembered that many mechanics furnish their own tools, which makes them more careful of them and incidentally saves the shop much money both in the matter of first cost and replacement through breakage and loss.

Lathe, Drill Press, Reborning Tool, etc. The dealer who carries a good line of parts and sells service and maintenance only on the make of car he sells will find little use for a lathe. But the all-purpose shop, doing a variety of work, cannot get along without a lathe. Also, the shop in the communities remote from a large city will find the lathe an indispensable piece of equipment. In conjunction with a drill press, a shop is equipped to handle almost any kind of a job, including light and heavy drilling and boring operations, truing crankshafts, grinding pistons, and many of the other operations which are fundamental in engine overhaul work.

Sooner or later the shop intending to do a variety of work must put in some sort of reborning outfit to renew bores which have worn oval and a finishing tool to give to the cylinder walls a smooth surface. There is no use to install new rings and pistons when the bores are not round and smooth. It is not likely that the average shop will put in a cylinder regrinder, because it always pays to send out this class of work when the bores are too far off to be refinished by the apparatus installed. At any rate we feel that most of the men operating shops will agree that the larger and more expensive machine tools had better be added when the volume of business warrants it, or if the shop is so situated that much work will be taken in calling for making parts or reconditioning parts not kept in stock.

If there is a man in the shop who is a good welder, it probably would pay to put in a welding outfit. It is one of the best ways to salvage a broken part and in the hands of a good operator will be productive of excellent results, with increased profits for the shop. But, a poor weld is worse than none and unless the work can be trusted to a competent mechanic it had better be sent across the street to the blacksmith who "has learned his trade" as one old fellow remarked, as he was making up a new spring leaf for a dealer's shop.

No mention has been made here of electrical shop equipment, in as much as this class of work seems to be destined for the shop doing nothing but electrical repair work. Of course, as in case of the welder, if the shop has a good electrician, there is every good reason for installing a test bench and other equipment to handle the usual line of starting motor, generator and ignition work.



One dealer's establishment, which makes a practice of putting all its used cars of various makes, in good condition, has installed this special line of wrenches, built to perform certain operations on certain makes of cars. This sort of equipment is invaluable, especially to the small town shop which necessarily must work on all makes of cars to come out ahead

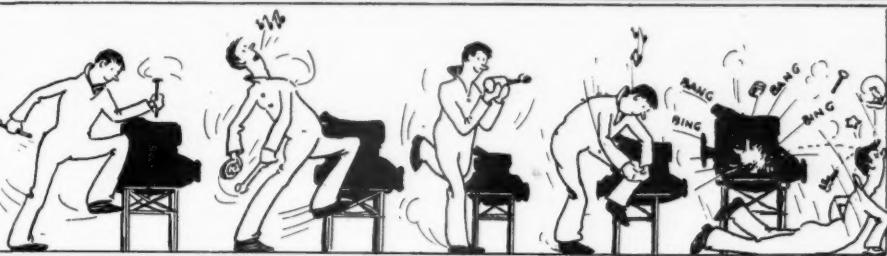
SEVEN LITTLE SERVICE MEN



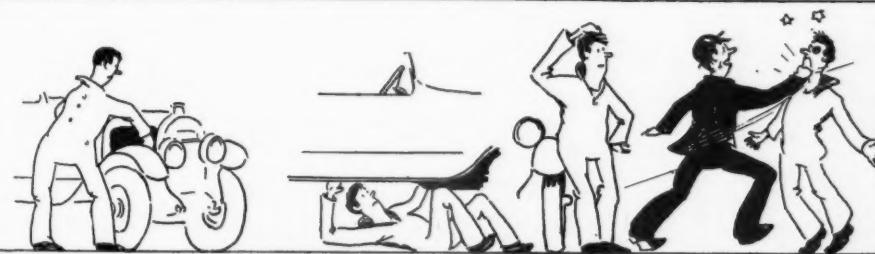
*Seven little service men
Working hard, by heck!
But one left grease on steering
wheels
And a woman broke his neck!*



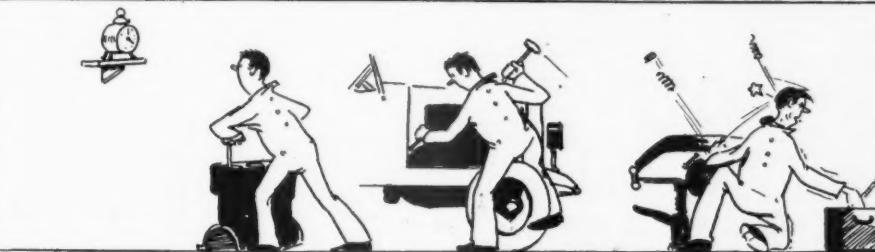
*Six grimy service men
Were busy all the day
But one forgot to mark job time
And so drew no more pay!*



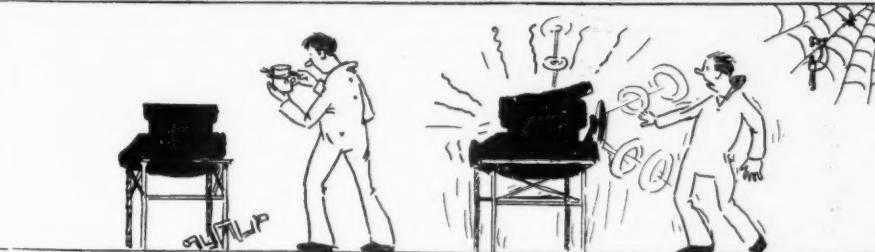
*Five happy service men
Were whistling on the job.
One left his wrench in the crank
case and
The doctor patched his knob!*



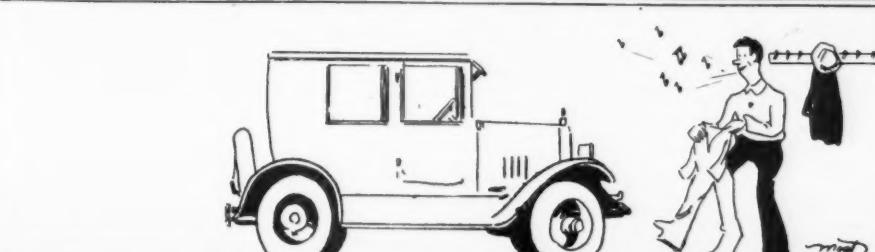
*Four cursing service men
Found every bearing shot.
One told the owner what was
what
And look at what he got!*



*Three lazy service men
Were loafing on the boss;
Who then decreed a piece-work
plan—
One couldn't stand the loss.*

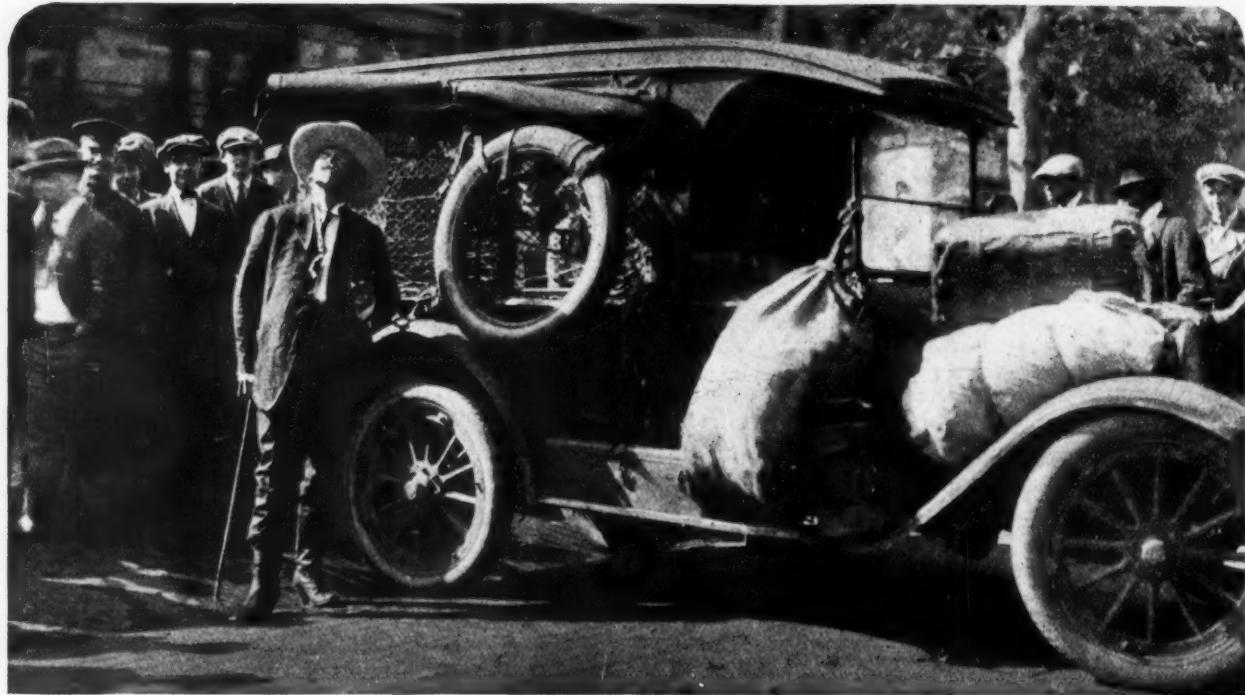


*Two careless service men
Were working on a Ford.
One couldn't read micrometers,
And so all four got scored!*

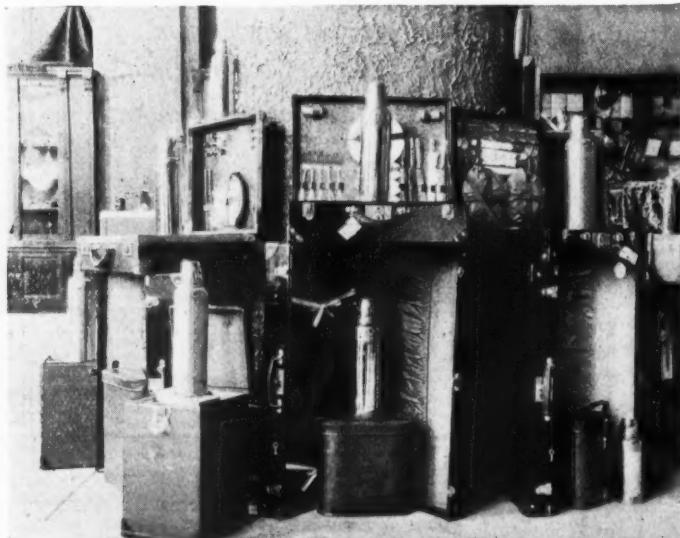


*One snappy service man
Looked out for everything,
And saved his coin. He's opening
His own place in the spring.*

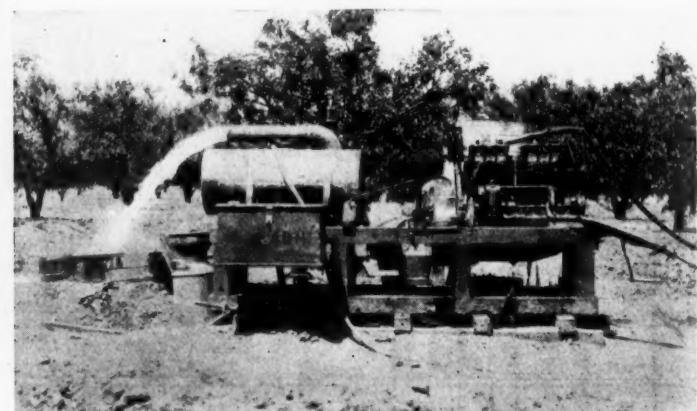
MOTOR AGE'S PICTURE PAGES



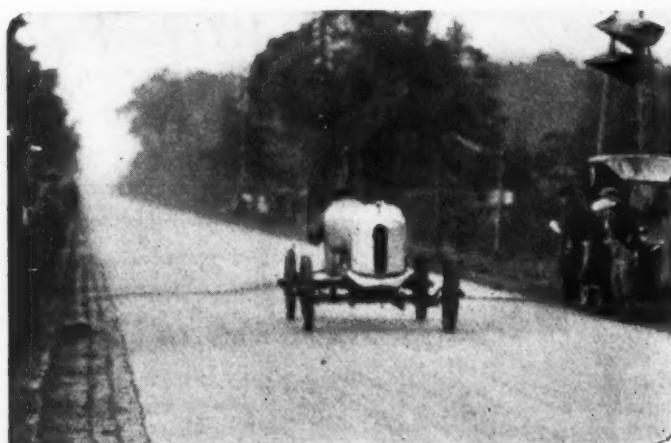
Grizzly bears for President Coolidge. And none other than Idaho Bill Pearson bringing them in a Dodge car. Case of where the grizzlies didn't dodge quick enough



Around the pillar (at the left) in the accessory store of Harold L. Arnold, Los Angeles, is this neat display of thermos bottles and lunch kits



Again the Buick valve-in-head. This time in the role of pump, supplying the M. S. Weber, Sutter County, Calif., ranch with water. The engine was removed from a car that had apparently expired



In which the Overland (to the left) comes over the electric timing ribbon on the final kilometer demonstrating American leadership to the Belgian race fans at Oostmalle, near Antwerp. G. Willford drove

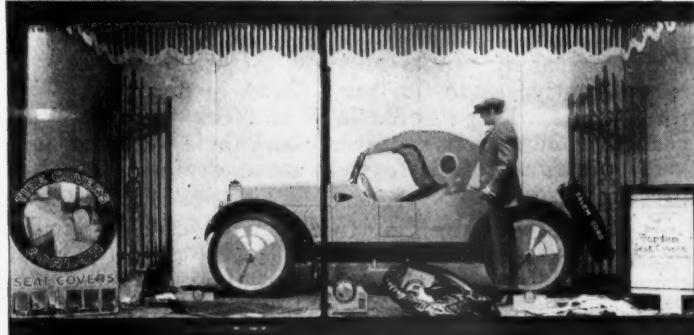


OF AUTOMOTIVE INTEREST

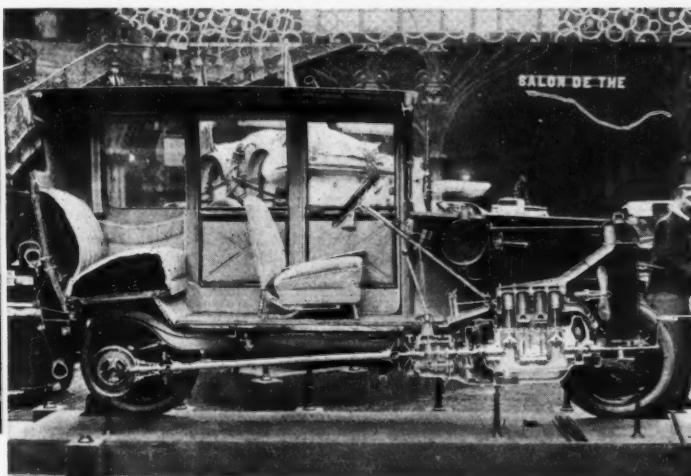


Setting off the Marmon in their show rooms, the More Automobile Co., St. Louis Marmon distributor, used this novel method of doing it. Lattice work and flowers made a striking display

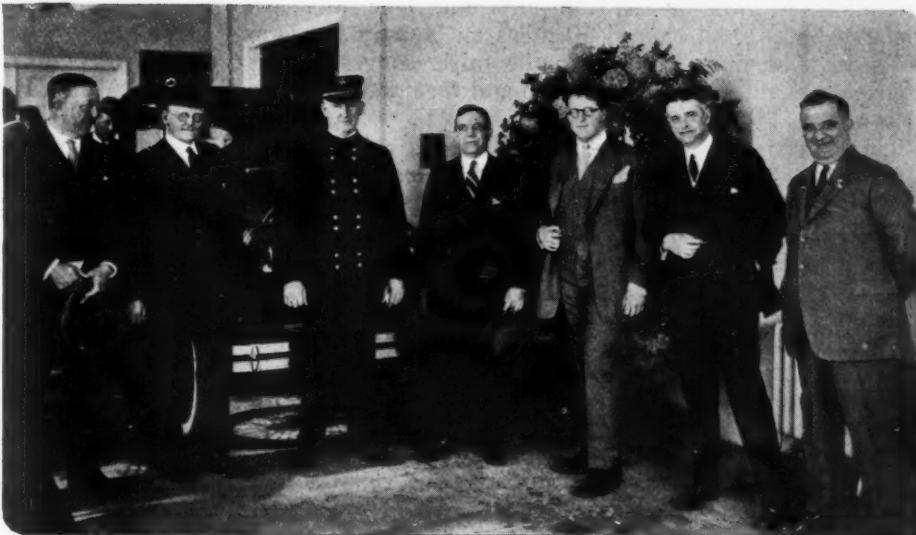
The completely sectional car, at the right, attracted much attention to the Citroen exhibit recently in France



Milton Hartman didn't let the matter of space interfere with a motor car in his accessory window. He reproduced the one shown here for Brager's department store in Baltimore and installed it in the window with the accessories which the store sells



Mayor Rolph of San Francisco gave the address of welcome to the Stutz company when it opened its San Francisco branch. Other prominent men were also in attendance. From left to right: J. J. Tynan, general manager Bethlehem Shipbuilding Corporation; Mr. Vogelsang, former U. S. Ambassador to Chile; Daniel Murphy, chief of the San Francisco fire department; Billy Hughson, president San Francisco Motor Car Dealers' Association; J. J. Tynan, Jr., vice-president, Stutz Motor Car Company of California; Charles Rosenthal, Jr., president and general manager, Stutz Motor Car Company of California; I. B. Meers, Stutz factory representative on the Pacific Coast



MOTOR AGE

Reg. U. S. Pat. Off.

Vol. XLIV

Thursday, December 20, 1923

No. 25

Julian Chase, Directing Editor	Clyde Jennings, Editor
B. M. Ikert, Technical Editor	

P. L. Dumas	A. H. Packer	Tom Wilder
-------------	--------------	------------

J. E. Schipper, Field Editor	W. L. Carver, Field Editor
------------------------------	----------------------------

C. G. Sinsabaugh, News Editor	
Warren Baker, Ass't News Editor	
D. M. McDonald, Detroit News	S. J. Shelton, Chicago News

Home Office, 5 South Wabash Avenue, Chicago
 Cable Address Motage, Chicago
 Telephone Randolph, 6960

BRANCH OFFICES

New York City—U. P. C. Bldg., 239 West 39th St., Phone Pennsylvania 0080
 Detroit—317 Fort Street, West, Phone Main 1351
 Cleveland—538-540 Guardian Bldg., Phone Main 6432
 Philadelphia—1420-1422 Widener Bldg., Phone Locust 5189
 Indianapolis—1212 Merchants Bank Bldg., Phone Circle 8426

Subscription Rates

United States, Mexico and U. S. Possession.....	\$3.00 per year
Canada	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies	35 cents

Subscriptions accepted only from the Automotive Trade

Entered as second-class matter September 19, 1899, at the post-office at Chicago, Ill., under the Act of March 3, 1879.

Copyright 1923 by The Class Journal Co.
Member of the Audit Bureau of Circulations
Member, Associated Business Papers, Inc.

THE CLASS JOURNAL COMPANY

Mallers Building, 5 South Wabash Avenue, Chicago

Horace M. Swetland, President

A. B. Swetland, Vice-President and Manager	C. A. Musselman, Vice-President and General Manager
E. M. Corey, Treasurer	W. I. Ralph, Vice-President

Owned by United Publishers Corporation, 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.

Traffic

THE chief of police of Chicago has proclaimed that an automotive vehicle shall not be driven faster than 20 miles an hour in Chicago, which includes a good deal of the northwestern part of the state of Illinois, a district in which a great deal of money has been spent to provide boulevards for fast transportation. The edict says that no driver shall exceed 10 miles an hour in the loop or business section, 15 miles in the fairly congested sections and 20 miles on the boulevard and farm land sections of the city.

This edict results from an abuse of street privileges by a few drivers of vehicles and from a complete breakdown of the police system of street regulation.

The driver knows full well that the tangled police operations in Chicago, where politicians have forced upon the people four distinct police forces, are conducive to graft and favoritism. Probably every dealer has had the experience of being warned away from a parking space in the street only to see some other driver place his car there. Graft is the only answer. Every driver in Chicago knows that the no-parking rules are violated daily. It is admitted that only those who are not identified with the proper political elements pay fines for traffic violations.

Every policeman knows that on his beat there are scores of cars parked without lights at night and that a consider-

able portion of the lighted cars do not conform with even the crudest idea of light regulations. He also knows that some drivers think they own the streets. The policeman also knows that most of the rumpus and injury caused in traffic is due to a few bad actors—some through ignorance, others because they are bad actors. But now the great majority of drivers—law abiding, fair minded citizens—are to suffer because of the rules made to catch the bad actors, who are bad actors because of police inefficiency and ignorance.

The answer as we see it, is to get intelligence into the planning of traffic rules and regulations and this will never be done until expert traffic men are called into the counsels. Managers of big fleets of trucks, taxicabs, busses, business passenger cars and the like are best educated in traffic affairs. Next to them come car and truck dealers, drivers of vehicles and next to the last come the policemen who have been running traffic and last of all the groups of legislators and aldermen.

Someday the engineers are going to whip this traffic problem, but until they get their plans made, why not have some really expert men on traffic make up a stopgap solution.

What has happened in Chicago is likely to happen any day in any other city and we suggest that dealers who read MOTOR AGE get busy before the so-called "speed blanket" is put on their community.



Xmas profits make the dealer smile.

**Tires**

THE recent meeting of the National Tire Dealers' Association apparently was a successful meeting from many points of view. The attendance was representative as to territory, if not in numbers. The tire dealers who gathered in New York were much in earnest, their actions were sane and their wants reasonable. It is unfortunate that more dealers were not present.

It must be discouraging to men who serve as officers of such an association and who give of their time and means to help the business in which they and thousands of others are interested, only to learn that the thousands are not ready to support the officers by giving a day or so to the cause. As a rule, the men who are at the head of these associations need less help than their fellows and their expenditure of time, energy and money is more for the benefit of the thousands than themselves.

We hope to see the day, when a tire dealers' meeting will attract representative attendance in numbers as well as from a territorial standpoint.



And it HAS been an "automotive Xmas."

**"A Higher Score in '24"!**

THIS motto, suggested on this week's Squeaks & Rattles page, is a good one to hang somewhere near you. Many things will be necessary to a higher score next year and foremost among them is your effort—without that, the great prosperity visited upon the industry during the year just passing cannot be duplicated. You profited by hard work and real thought in 1923—you can gain greater profit in 1924 by just a little harder work and more real thought.

What Old Scrooge Might See

THIS issue of MOTOR AGE will reach you shortly before Christmas, just about the time you are giving your most serious thought to this most universal of all our holidays. You doubtless will think most of Christmas in terms of your family and friends, and that is proper. Here in the office we like to think of MOTOR AGE as a living force, something vital to the industry that our magazine represents and we like to think of MOTOR AGE in the terms of family and friends.

Supposing that this year some of the Old Scrooges of the automotive industry, especially those who can see no good in the maintenance end of it, should be prevailed upon to make a "Christmas Carol" flight and see what they could see. Do you suppose that their report would mean a Merry Christmas to MOTOR AGE?

We may be confirmed optimists, but we believe that the most inveterate Scrooge could see many things in the automotive dealer field that would bring him to a belief that there are prospects of a Merry Christmas and that our people—the friends and family of MOTOR AGE—do not this year need charity.

Let's think it over. What will we find in the Christmas stocking this year?

First off, there is the fact that the equipment makers and dealers are selling to our especial friends a better quality of equipment and a more useful equipment than ever before.

Closely connected with the sale of this equipment, is an information service on how to use this equipment and fully as important as this is the service on how to charge for the use of this service so that it will be made profitable. At Christmas time, we dislike to suggest sorrows, but some sorrows are constructive in that a contemplation makes us see the things that we can be thankful for. Look over the list of failures you recall during the past year and note how many of them failed because they did not know how to charge and collect.

Granted that you are buying the right equipment and you know how to use it, what next?

Here it is: The spread of the flat rate idea, a move that is going to put the automotive maintenance man in the class of respectable merchants who know their own business. No one who is in touch with the automotive dealer business can doubt for a moment that the package of flat rate in the stocking this year is much larger than the package of the same confection last year, for the flat rate is the sweetening of the maintenance business.

Another Christmas package that is larger and better than ever:

The number of automotive dealers who are realizing that theirs is a transportation business, a service if you please, rather than a store where only package goods are sold. They are realizing that there is a potential profit every time the cash register rings and that many of these small profits equal a large profit.

MOTOR AGE has evidence that more and more dealers are realizing that some of their prosperity depends upon a better equalization of their business and many of them are using their sales ability to sell more and more in what have been the dull months, so that the families that are dependent upon their business may be properly fed and clothed at all times of the year and that these men may work twelve months in the year at the work they love.

Also we must include the greater interest manifested by the vehicle manufacturer in dealer and maintenance affairs. Never before in the history of this industry has the manufacturer been so solicitous of the welfare of his men on the firing line. Never before have his vehicles shown so many changes in the interest of reasonable maintenance and more and more is the manufacturer showing a disposition to be tolerant with merely human failings in the organization that supports his great institution and a greater interest in helping these men, who make the wheels of his vehicles go round day after day, to overcome the difficulties that he has made for them.

Altogether we believe that the automotive dealer stocking is quite well filled this year and that Scrooge would see by means of his mystic sight a very large dealer group, charitable toward their critics and improving themselves from day to day.

More than that we cannot ask, except that it continue.



Tax Repeal Bills Introduced

Measures Intended to Remove Levy on Automotive Products

Saving to Motorists if Legislation Passes. Is Estimated at \$144,000,000 in Next Year

WASHINGTON, Dec. 15—Repeal of the excise taxes on automobiles, trucks, motorcycles, tires, inner tubes, parts and accessories was asked for under the terms of a bill introduced in the House by Representative Robert H. Clancy of Michigan. The repeal of these taxes, characterized as discriminatory and unjust, would mean a saving of approximately \$144,000,000 to the automotive buying public during next year.

The fight for the tax repeal, which is being fostered by the National Automobile Chamber of Commerce, is to be made in three separate bills, the first (No. 2891) asking for the removal of the 5 per cent excise tax on automobiles and motorcycles; the second (No. 2892) for the removal of the 3 per cent excise tax on trucks, and the third (No. 2893) for repeal of the 5 per cent tax on tires, inner tubes, parts and accessories.

WORK FOR TAX REDUCTION

NEW YORK, Dec. 15—Over the signature of John J. Rackob, chairman of its finance committee, the General Motors Corp. has sent a letter to each of its stockholders and employees dealing with the Mellon plan of tax reduction. Each is asked if he favors such tax reduction to sign an enclosed letter to Congress urging it to "take an aggressive and persistent stand for lower Federal taxes and to support a tax reduction plan substantially along the lines" advocated by the Secretary of the Treasury and "to refrain from voting in favor of any legislation, which will interfere with the carrying out of such tax reduction program." These letters will be sent to Congress by General Motors.

VER LINDEN BUYS FOUNDRY

DETROIT, Dec. 15—The Ryan-Bohn Foundry Co.'s real estate, plant and equipment in Lansing was bought in by Edward VerLinden, president, at receiver's sale this week for \$300,000, the price being subject to confirmation by Judge Charles B. Collingwood. VerLinden left Lansing following the sale without statement as to his plans for operation of the plant should the bid be confirmed.

VerLinden was formerly president of Olds Motor Works and later was president of the Durant Motor Co. of Michigan.

VESTA BATTERY STATEMENT

CHICAGO, Dec. 15—A financial statement of the Vesta Battery Corporation as of Oct. 31, 1923, shows total liabilities of \$192,589.34 as compared with current assets of \$793,044.97 and total assets of

How Dealers May Help Get Tax Removed

Every dealer who sells new automobiles knows that the price he must quote his customers for cars delivered is the F. O. B. factory price plus freight and war tax. The war tax on passenger cars is five per cent. On a car listing at \$1000 this amounts to \$50, which is in effect the addition of that amount to the price of the vehicle. In other words, elimination of the tax would be equivalent to a reduction of \$50 in the price of a \$1000 car. There is also a war tax of five per cent on tires, tubes, accessories and most of the supplies the motorists have to buy. Relief from these taxes can be had only by act of Congress and if the great army of motorists, who with their families clearly constitute a great majority of the voters, would unite in demanding repeal of these taxes Congress would be very likely to grant the request. Automotive merchants have the opportunity to aid in this movement by talking about it to their customers and encouraging them to communicate their desires to their representatives and senators.

\$1,346,755.57. Liabilities included bank loans of \$100,000, but on Nov. 27 this figure had been reduced to \$20,000, according to Ward S. Perry, president, who added that the financial condition of the company is now the best in its history.

In connection with the statement President Perry took occasion to declare that the Vesta Corporation has neither received nor invited any proposals whatsoever for purchase of a controlling interest in the company by outsiders.

BELLBOY WINS PRIZE

PHILADELPHIA, Dec. 15—First prize for a poster advertising the 1924 Philadelphia automobile show was won by James Haffey, a captain of bell boys in the Robert Morris Hotel. The prize of \$150 was offered by the Philadelphia Automobile Trade Association. There were 25 competitors. The winner is a veteran of the great war who was given an art course by the Government and is working at the hotel while trying to get established as an artist. The Philadelphia show will be held Jan. 12 to 19.

POSTPONES DECISION ON RECEIVER

BOSTON, Dec. 15—Judge Lowell, in the Federal district court, took under advisement the question of appointing a receiver for the R. H. Long Co. and the R. H. Long Motors Co., but before announcing his decision he stated that if it were true that the companies were solvent there was no need of court action. Opinion was pretty well divided between those seeking a receiver and those who opposed the plan.

N. A. C. C. Committee Calls on Membership to Urge Passage

Points Out That Only Hope for Relief Is Through Conceted Demand on Congress

NEW YORK, Dec. 15—The Taxation Committee of the National Automobile Chamber of Commerce has got behind the three bills introduced in the House of Representatives by Representative Clancy of Michigan, which call for the elimination of the excise tax on automobiles, trucks and accessories and letters have been sent to members of the Chamber, urging that they give support to these measures.

The Taxation Committee did not know in advance of Congressman Clancy's intention to lead the fight on the excise tax, but his action is in keeping with the policy decided on by the Chamber some time ago so that the committee apparently is satisfied with the movement inaugurated by the Michigan Congressman.

After the filing of the three bills in the House Monday the Taxation Committee of the N. A. C. C. sent a letter to members of the Chamber over the signatures of C. S. Hanch, chairman; H. H. Rice, F. J. Haynes, David S. Ludlum, George M. Graham and Pyke Johnson, secretary, which commented on President Coolidge's message to Congress, saying in part:

Nothing on Motor Vehicle Tax

"While the message calls attention to the need for relief for the farmer through lighter taxation and dwells also upon the need for efficient transportation, no mention is made of any abatement of the discriminatory excise taxes levied against the motor vehicle."

"It thus becomes apparent that while a hard fight will be made for tax reduction, the only possible chance for relief for those who drive cars is through a strong demand exerted directly upon Congress. This cannot be effectively manufactured. It must be a genuine protest based upon knowledge of facts and it must come from every section of the country."

"If you believe with your committee that these taxes are unfair and should be removed, ask your dealers and your customers to take the subject up without delay and place the matter before your own representatives in Congress, personally. There is no other way by which you can obtain relief."

"Representative Clancy of Michigan has just introduced in the House of Representatives, bills calling for the repeal of the tax on automobiles, trucks and wagons, parts and accessories, tires and inner tubes. We suggest you urge your Congressman to support these bills if you want the tax repealed."

No Decline in December Production

Sacramento Dealers Decide to Liquidate Appleby Mart

Abandon Certified Used Car Market After Withdrawal of a Number of Merchants

SACRAMENTO, Cal., Dec. 15—The Certified Public Used Car Market formed in this city on June 20, last, by the Sacramento Auto Trades Association, has closed its doors and the business is being liquidated. The market was conducted along the Appleby plan.

At the time the market was organized practically all dealers in the city were parties to the plan. A short time after it began functioning, however, individual dealers began to drop out until during the past month or more only a few firms, largely low-priced car dealers, remained. Last week these gave up the effort to keep the market open.

Cars taken in by dealers and handled through the market have reverted back to the dealers. The closing of the market has caused some inconvenience as in many cases dealers gave up used car salesrooms on entering the market.

Those dealers who remained in the market until the end blame its failure on lack of support by the trade. They declare certain firms were more anxious to "horse trade" than to conduct business along profitable lines.

Those who left the market early in its history, however, claim that the market appraisals were so low that purchasers would not do business with them and that they could make more money by handling their used cars themselves.

The market had slightly over 100 cars on hand when closed. It is understood that no heavy financial loss was suffered by the dealers involved.

EXPANDS BRAKE LINING SALES

A statement published in MOTOR AGE, Dec. 6, to the effect that the Manhattan Rubber Manufacturing Co., of Passaic, N. J., had departed from its practice of selling Hycoe brake lining as original equipment was erroneous. Instead, the company has found that the demand for this brake lining is such that it is forced to expand its selling policy and instead of only supplying it as original equipment, it has established replacement outlets with many of the leading jobbers, still continuing, however, to supply Hycoe to automobile manufacturers.

ONE CHANCE IN A HUNDRED

WASHINGTON, Dec. 17—A motorist of the nation's capital, where laws against such things are passed, has one chance in a hundred of having his car stolen, figures compiled for the first 11 months of the current year by the Metropolitan police show. On the other hand out of every 100 cars stolen, 92 are recovered,

the figures show.

During the 11 months period 1,037 cars were stolen, of which eight were from members of Congress, and of this number 954, including six of members of Congress, were recovered. For some reason, unexplained, figures covering the past six years show that in November automobile thieves are the busiest, with October ranking second.

SULLIVAN ELECTS

SULLIVAN, Ind., Dec. 17—The Sullivan County Automotive Association has elected new officers as follows: President, Walter Dixon; first vice president, J. D. Boswell; second vice president, William Powell; secretary, Ray Wyman; treasurer, James Scully.

After hearing an address by Paul Brophy of the Percy Chamberlain Associates on the Appleby used car plan, the association appointed a committee to investigate various plans proposed for handling used cars.

EARL NOT TO EXHIBIT

DETROIT, Dec. 17—The Earl Motors Mfg. Co. will not exhibit at the National shows this year in the absence of determination as to the future course of the concern. The factory is being operated by the banks under a controller who is liquidating the inventories of the company. Production of cars is being carried forward on a limited scale and servicing of cars in owners hands is also producing considerable business.

PLAN MOTOR TRANSPORT CONGRESS

DETROIT, Dec. 15—The foreign trade committee of the National Automobile Chamber of Commerce held its first meeting with its new chairman, John N. Willys, at the Detroit Athletic Club this week to discuss details of the program for the World Motor Transport Congress. This is scheduled to be held in Detroit May 21 to 24, 1924.

\$35,000,000 CHAMPION SALES

TOLEDO, Dec. 15—Sales of the Champion Spark Plug Co., are approaching a record of \$35,000,000 gross this year, according to an announcement made by President Robert Stranahan to salesmen of the company here for an annual conference this week.

4-WHEEL BRAKES FOR MOON

ST. LOUIS, Dec. 18—Four-wheel brakes of the Lockheed hydraulic type will be a feature of the 1924 Moon cars, it is announced by the factory. A Moon car with these brakes will be exhibited at the New York show which opens Jan. 5.

NEW ASSOCIATION SECRETARY

RICHMOND, Ind., Dec. 17—H. R. Marlatt has been appointed secretary of the Wayne County Automotive Trade Association, succeeding Clem McConaha,

Curtailment to Come However in Last Two Weeks of Month

Will Effect Total Production But Run Well Ahead of 1922

NEW YORK, Dec. 17—Schedules governing operations in major automobile producing plants showed no decline the first ten days of this month from the pace followed in similar periods in October and November. Curtailment is due to come the latter part of December when some producers will either close their plants for a brief time or reduce programs materially while inventory is being taken and manufacturing facilities readjusted.

This curtailment will affect the total production for the month but the output will be considerably greater than that reported in December of last year. Major factories are operating on programs far in advance of a year ago and are not likely to bring their schedules down to last year's level. This year Ford will shut down for only two days and is likely to report a total production of 150,000 with possibilities that the 160,000 figure will be reached for December. A million sales mark is the goal set by this company for the six months ending March 31.

Indications are that major producing plants will renew activities on high schedules the first of the year and while many producers have announced programs for 1924 operations, definite figures for the majority will not be fixed until after the New York show in January. This show is regarded as a barometer of buying interest.

Shipments from factories to dealers are reported as being close to the high figures maintained during the year. There is an increasing tendency among dealers to stock cars against spring demand to forestall any shortage when the heaviest demand of the year comes. In some sections of the country, particularly in California and parts of the south, a scarcity of cars is evident, precluding the possibilities of any accumulation of stocks there for some weeks to come.

An encouraging tone is given to truck operations due to the fact that at least one large manufacturer has returned to production after a period of idleness in which manufactured goods were being cleared. As a general rule, however, inventories of finished trucks have been kept at a low point. The market is somewhat slow but manufacturers are doing a margin of business which keeps them on the right side of the ledger.

Tire makers show improved conditions with inventories being reduced and shipments increasing. The parts branch of the industry shows activity in keeping with the operations in car and truck plants. Sales are good and collections continue satisfactory.

\$250,000,000 Worth of Cars in 1924, Is Willys Plan

Contracts Already on File Call for More Than 300,000 Cars to Supply Demand

TOLEDO, Dec. 17 — Willys-Overland plans to produce \$250,000,000 worth of automobiles during 1924.

President John N. Willys announced today that, according to contracts already on file with practically all of the Willys-Overland branches, distributors and dealers throughout the world, Willys-Overland production will have to exceed 300,000 cars to take care of the apparent demand. The increased Willys-Overland dealer organization, compared with this period last year is more than 100 per cent.

As the initial step toward the fulfillment of these orders President Willys has further announced a curtailment of the annual inventory period, which begins Dec. 17. In previous years this work always has taken until after the holidays, but this year instructions have been issued that the work must speed up so that the wheels of production will be turning again by Jan. 1.

During 1923 Willys-Overland's production amounted to more than 200,000 cars, doubling last year's output.

With the 1924 demand anticipated, President Willys has been in constant conference with the factory organization regarding plans that will permit a resumption of activities following the curtailed inventory period on a much greater scale than ever attempted previously.

In order to meet the demand, Willys-Overland production will be stepped up to more than 30,000 cars a month in the early months of the year.

30,000 IN 1924

DETROIT, Dec. 15—The Manchester plant of Ford Motor Co. of England, Ltd., the largest automobile factory in the British Isles, has set a schedule of approximately 30,000 cars for production in 1924. This compares with about a similar total for 1923, indicating that the company looks for no falling off in buying in the new year, despite the record totals of the present year.

The British Ford car which is sold only in England and Scotland and the Ulster province in Ireland, is now 95 per cent British, both in manufacture and materials. When first established it was dependent on the Ford Motor Co. of America for parts, but with factory expansion this condition has been changed so that the British company is practically a complete producer in itself.

IOWA BUSINESS IS FAIR

DES MOINES, Iowa, Dec. 17—Iowa automotive men are fairly well pleased over the tail end business for 1923. New models and price reductions have helped to stimulate business to some extent. According to Dean Schooler, president of the Iowa Automotive Merchants' As-

sociation, Des Moines dealers did a very nice business during the last two months. Reports from outlying sections of the state indicate a "spotty" condition. One section reports excellent business, while another section has found business to be very poor. This may be due in part, to the condition of the Iowa corn crop. Certain parts of the state report that corn is of very good quality but at other places, much soft corn is encountered.

Fabric Body Corp. Formed as Builder of Fabric Bodies

DETROIT, Dec. 17—The Fabric Body Corp. has been formed to operate as sole licensee in promoting the building of fabric bodies in the United States and Canada and has opened offices and show rooms at 5940 Cass avenue, this city. Kenneth L. Childs, originator of this type of automobile body, has been elected to the presidency. He also is consulting engineer of the Standard Textile Products Co., which has developed in its Meritas leather cloth a two-ply material adapted to the outer covering of fabric bodies.

Four Meritas-made fabric bodies built on the Childs system will be exhibited in the Commodore hotel during the New York show; one a Packard sedan which has had 20,000 miles of rough going, one a custom job on a Lincoln chassis, and the other two developments in custom type bodies on Ford and Dodge chassis.

REO FURNISHES BALLOON TIRES

DETROIT, Dec. 15.—The Reo Motor Car Co. is offering balloon tires as optional equipment on its entire line of passenger cars at an increased cost over list price of \$100 and \$135. The tires are U. S. cords 32x6. On the sedan, coupe, brougham and phaeton the additional cost is \$100 and on the phaeton \$135. The additional cost in the case of the phaeton is due to use of Turac disc wheels which are standard equipment on the other models. Wood wheels are standard on the phaeton.

CLAIMS "SUPERCHARGER" RIGHTS

PARIS, Dec. 1—(By Mail)—Claiming to have registered rights in the word "supercharger," the Daimler Motoren Gessellschaft is attempting to forbid its use except when applied to its Mercedes engine fitted with this device. This being a general expression which was in common use in connection with aviation engines during the war, it remains to be seen whether the courts will uphold the claims made by the Mercedes concern.

BUYS TRUCK FACTORY

DANVILLE, Pa., Dec. 17—The Kearns-Dugh Motors Corp. of Danville, manufacturer of Kearns trucks, has purchased all the assets of the Belmont Motors Corp. of Lewistown, Pa. The Kearns plans to increase its production of trucks and fire fighting apparatus, using the Lewistown plant for manufacture and the Danville headquarters for sales and service.

Jordan Stockholders May Let Jordan Car Be Their Santa

The Question of a 600 Per Cent Stock Dividend Decided at Dec. 22 Meeting

CLEVELAND, Dec. 15—Stockholders of the Jordan Motor Car Co., of this city, will meet Dec. 22 to decide whether they shall vote themselves a Christmas gift in the form of a 600 per cent stock dividend. The economical and efficient management of the company has made this possible. In such strong condition is the company, that in the event the stockholders declare in favor of the big bonus, a dividend rate of \$3 a share is likely to be established on the new stock at the start.

Edward S. Jordan said in an official statement: "Directors of the Jordan Motor Car Co., Inc., on Dec. 10 adopted a resolution calling for a meeting of stockholders to be held Dec. 22, to consider the advisability of increasing the authorized common shares of no par value to 200,000 shares of no par value. If this is authorized by the stockholders the capitalization of the company will then consist of 12,000 shares of preferred stock of \$100 each and 200,000 shares of no par common stock. Should the stockholders declare in favor of the big bonus, present intention of the directors to declare a stock dividend of six shares of common stock upon each share of common stock outstanding, so that if this plan be consummated the present holder of one share of Jordan common stock will be the holder of seven shares of the company's common stock."

GRAND PRIX PRIZES

PARIS, Nov. 28 (By Mail).—Cash prizes to a total of 230,000 francs will be offered in connection with the European Grand Prix race for 122 cubic inch cars, the date of which has been fixed for Sunday, August 3rd, at Lyons. This is the first occasion on which the Automobile Club of France has offered a money prize for any event it has organized, for until quite recently it was strongly opposed to races being run for anything but the glory attached to them. It is understood that the winner of the Grand Prix 122 cubic inch race will receive 100,000 francs cash; the second man home will receive 25,000 francs, and the third 10,000 francs.

TRAILER MAKERS ELECT

NEW YORK, Dec. 18—The Trailer Manufacturers' Association of America elected officers at its meeting in Detroit recently as follows: President, M. E. Crow, of the Troy Trailer & Wagon Co.; first vice-president, H. C. Fruehauf, Fruehauf Trailer Co., Detroit; second vice president, S. B. Winn, Lapeer Trailer Corp., Lapeer, Mich.; secretary-treasurer, Henry M. Wood, Trailmobile Co., Cincinnati. Allan P. Ames was appointed manager of the association and headquarters will be at 115 Broadway, New York City.

Motor Truck and Stage Lines Play Big Part in California

677 Commercial Automotive Lines Operating in State; 164 Trans- port Freight

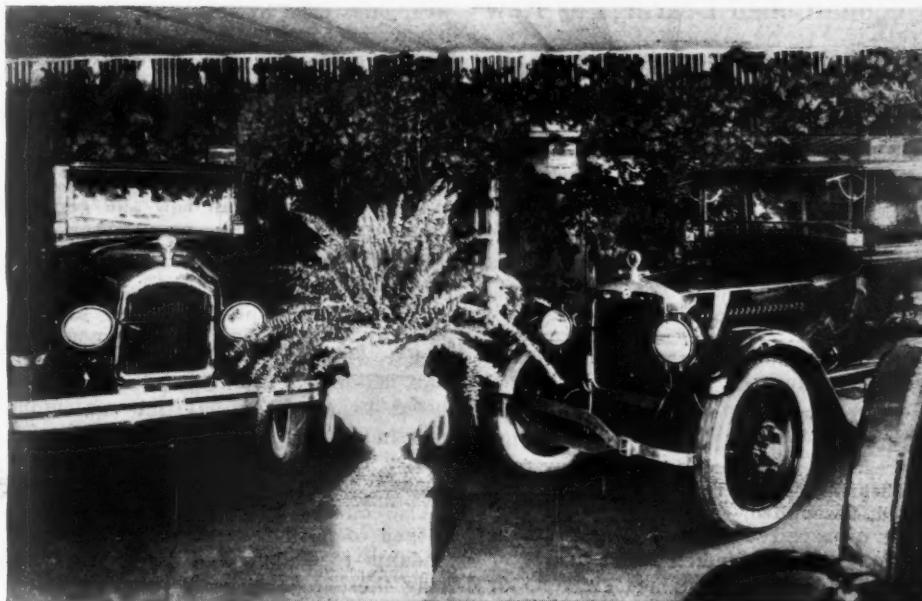
SACRAMENTO, Calif., Dec. 17—The tremendous part the automobile stage and motor truck are playing in the development of California is shown in the report of the California State Railroad Commission, just issued, but dated Nov. 15, 1923. This report shows that there are 677 commercial automotive lines operating in the state under the jurisdiction of the commission, of which 164 transport freight only, 133 passengers only, 107 passengers and freight, and 138 carry passengers and express. Three carriers transport school children only, and one is devoted to the transportation of express. Passengers, express and freight are carried by 39 and 24 combine freight and express in their business.

There are 68 of these carriers which limit their cargoes to certain commodities, such as milk and eggs, milk and cream, poultry and eggs, lumber, automobile parts and accessories, motion picture films, fresh fruits, vegetables, and berries. One line of motor trucks handles only livestock, rather a change from the old scheme of making the steer walk to market and the horse trot to his work. The vegetable, fruit and berry carriers are for the most part seasonal operators, limiting their hauls to that time of year in which these products are ready for the market. These come under the recent amendment to the auto stage and truck transportation law by which those who are engaged in transportation directly between farms, orchards and dairies and the markets need not obtain certificates for operation, but must file schedules of rates with the railroad commission.

A number of other freight carriers, and some auto stage lines operated only for passengers, also list themselves as "seasonal operators," whose business is affected by the opening and closing of summer resorts, and others who are forced off the mountain highways by inclement weather through some part of the winter months. In these cases the commission allows such carriers to reduce their scheduled trips during such periods, but stipulates that full schedules must be restored and maintained while the resorts are open and while the weather is fair. As a result of this flexible method of operation, there are few spots in California which are not accessible by auto stage. Mountain barriers no longer exist, and even the terrors of desert travel have been overcome, while from Siskiyou to San Diego and from Reno to the sea good roads offer opportunities for the motor truck and the auto stage.

The report further shows that 1616 passenger, 959 freight trucks, and 335 trailers and wagons are in use, not including leased vehicles which increase this list by approximately 200 stages and

Prize Winning Closed Car Exhibit



This exhibit by the United Auto Sales Co., Studebaker dealer at Baltimore, won first prize in the recent closed car exhibition contest held by the Automobile Trade Association of Baltimore. This shows one corner of the display. In all seven Studebaker closed models were shown.

trucks. Including equipment owned and operated by small lines, on which no report is made, and those trucks operated between farms, orchards and dairies and the markets, as above mentioned, it is safe to assume that there are at least 3300 auto stages, motor trucks and trailers devoted to common carrier purposes on the highways of California today. These properties are estimated to represent an invested capital of \$12,500,000. In the calendar year 1922, the common carriers of California using automobiles transported 21,221,928 passengers, and their revenues from motor operations totalled \$15,549,349.94, with operating expenses of \$14,322,725.34.

GMC NEW BRANCHES

DETROIT, Dec. 17—During this year General Motors Truck Co. has established seven new branches, located at Denver, Pontiac, Minneapolis, Spokane, Seattle, Milwaukee and Birmingham, Ala. There has also been an extensive widening of its distribution field and the company's sales organization is declared practically complete for nation-wide operation in 1924.

P. H. Kelleher, of the factory sales force, has been appointed manager of the Louisville sales branch, succeeding B. E. Boyes, who has been transferred to the San Francisco organization. A. J. Schamehorn and W. L. Shaffner have been appointed members of the sales department.

200 SALESMEN MEET

NEWARK, N. J., Dec. 15—More than 200 automotive salesmen of Newark and the vicinity attended the salesmen's convention of the Newark Automobile Trade Association held here this week.

Jordan Tells What He Knows About Engineers at S. A. E.

CHICAGO, Dec. 15—Edward S. Jordan, president of the Jordan Motor Car Co., was the speaker before the Mid-West Section of the S. A. E. here last night. The speaker said that he wished to correct the S. A. E. Journal announcement of his subject as "What I Know About Engineering" to "What I Know About Engineers," as he considered these topics as meaning distinctly different things.

"The engineer," said Jordan, "is fundamentally honest and his opinion is worthy because of that fact. An engineer, if he deserves the title, demands facts and works only on facts, while the salesman and the purchasing departments work with entirely different objectives."

Jordan then told in his personal, semi-humorous manner how the Jordan company was originated and the methods of designing that car. His sole instructions issued to his engineer, he said, were those already made more or less familiar through his public talks: 1, style; 2, comfort; 3, reliability; 4, performance; 5, SERVICE.

At the close of his talk, Jordan offered to answer any questions and the queries put to him were chiefly of a nature that were answered by fact, not opinion.

OLDS SIGNS NEW DEALERS

DETROIT, Dec. 15—Olds Motor factory branch at Lansing, distributor for all Michigan outside of territory covered by the Detroit branch, reports contracts from dealers for delivery of 4,800 cars by July 1. Eighteen new dealers are reported signed in the past 30 days.

U. S. Court Enjoins Sale of Reconditioned Bearings as New

Grants Petition of Timken Company Against Concern Dealing in Used and Obsolete Types

NEW YORK, Dec. 15—Judge Augustus N. Hand, of the United States District Court for the Southern District of New York, has granted a permanent injunction against the Schuman-Tigar Bearing Co., Inc.; the M. George Tigar Bearing Co., Inc.; and M. George Tigar, all of New York, in the suit brought by the Timken Roller Bearing Co., of Canton, Ohio.

The defendants are enjoined "from selling or in any manner advertising, representing or offering for sale any roller bearings or parts thereof manufactured, assembled, converted, altered, rebuilt or repaired by said defendants or any of them as 'Timken roller bearings,' and from using the name 'Timken,' or any name, designation or description of which the name 'Timken' forms a part in any manner whatsoever in connection with the sale, advertising or offering for sale, of such roller bearings or parts thereof."

The injunction also prohibits the defendants making use of boxes or cartons similar to those used by the Timken company, inducing or attempting to induce dealers to handle any bearings which might be construed as being bona fide products of the Timken company or trying to sell such bearings to the public itself.

The case against the defendants is outlined in Section 12 of the Timken company's bill of complaint, which says:

"Upon information and belief, the defendant Schuman-Tigar Bearing Co., Inc., and the defendant M. George Tigar, with the intent and purpose of unfairly competing with the complainant and appropriating to themselves the good will and business which complainant has acquired, and misleading the public, and with the intent of passing off their product as the new and genuine product of the complainant, have obtained from various sources other than the complainant, old and used Timken roller bearings and new Timken roller bearings of obsolete sizes, and have converted the same into more readily saleable sizes by first heating the parts of said bearing and thereby withdrawing the temper from the same, then boring out the insides of the cups and cutting down the outer sides of the cones and rollers and afterwards re-heating, re-grinding and re-assembling said cones, cups and rollers. Said defendants have also re-built and re-assembled old and used Timken roller bearings by using the parts of different bearings. After so converting, rebuilding, and re-assembling said Timken roller bearings, defendants have stamped said bearings with the same numbers and combinations of numbers and letters used by complainant to designate the different sizes of its bearings and have lubricated, wrapped and boxed said bearings in lubricant, waxed

paper and pasteboard cartons exactly similar to the lubricants, cartons and wrappings used by the complainant, and having exactly the same printed matter on the outside of said cartons as that contained on the cartons used by the complainant, and have sold and are now selling and offering for sale, and are inducing dealers to sell and offer for sale, said bearings so converted, altered and assembled by them as new and genuine Timken roller bearings manufactured by this complainant."

It also was charged in the bill that the re-grinding and re-heating process used by the defendants weakened and withdrew the temper of the original bearings, making them likely to break if subjected to approximately the maximum load and speed under which they are expected to operate, thus damaging the Timken company's reputation.

Also offered in evidence were letters alleged to have been written by the defendants to dealers and distributors offering these reconditioned bearings at 55 per cent off list.

"We consented to the injunction granted to the Timken Roller Bearing Co.," said M. George Tigar. "We have been salvaging old Timken bearings and selling them as Timkens, but we now have discontinued the use of the name 'Timken.' We still recondition Timken bearings but we are marketing them under the name 'Tigar.' Mr. Schuman no longer is connected with our organization."

OFFERS CARS TO POOR

LOUISVILLE, Ky., Dec. 17—For the fifth consecutive year the Quick Tire Service, 1101 South Third Street, distributor of United States Tires, offers the use of its six service cars on Christmas Eve, Christmas day and Christmas evening for the free delivery of charitable gifts to the poor.

Says 5 Policemen in Car Equal 100 Patrolmen

CHICAGO, Dec. 15—One automobile with a crew of five men is the equivalent of 100 patrolmen in combatting criminals, according to Mayor Dever of Chicago who this week told the local American Legion how the city police department is using motor cars as an aid in law enforcement.

The mayor said the city council has recently provided the police department with 20 new powerful automobiles which will be kept constantly in service with a crew of picked officers in charge of each. These cars are to be always within call of headquarters and when word is flashed to them they will be instantly and swiftly in pursuit of the assignment given them.

"Gasoline has helped the criminal; now we're making it help the policeman," the mayor said.

N. A. C. C. Traffic and Safety Committee Holds First Meeting

Holds Promise of Being One of the Most Important of N. A. C. C. Bodies

DETROIT, Dec. 17—The Traffic and Safety Committee of the National Automobile Chamber of Commerce, only recently created, held its first meeting in this city last week, presided over by Chairman George Graham, and with all its members—Alvan Macauley, E. S. Jordan, A. B. C. Hardy and George H. Pride—in attendance.

Promising to be one of the most important of the N. A. C. C. committees, the Graham body took advantage of the opportunity to get its bearings before attempting to adopt a definite policy. The scope of the committee was outlined, and after threshing over various problems it was decided to wait until the next meeting which will be held in New York Jan. 9 before outlining the platform. The members of the committee wish time to study the data on hand before making any commitments, so that remedies suggested will not be simply theoretical.

One decision arrived at was to organize some central assembling point of statistics on causes of accidents and newspapers and other important local institutions will be asked to co-operate in gathering casualty statistics for the committee. A questionnaire is being drafted for distribution which will thoroughly cover every accident and if this blank is used by the authorities the statistics gathered as to causes, etc., will be most valuable.

Along these lines an idea was advanced which seemed to meet with favor. That was that in serious accident cases the cars involved be impounded by the authorities immediately so that their mechanical condition can be ascertained before the owners have any chance to prepare any alibis based on alleged broken steering knuckles, faulty brakes, etc. The committee will go into this subject more fully at its next meeting.

R & V CLOSES FOR INVENTORY

EAST MOLINE, Ill., Dec. 16—The R & V Motor Company factory closed today until after the first of the year to permit inventory and some changes in factory arrangements. The offices of the plant are continued as usual. The factory operated on full-time schedules in the summer to give production for this temporary suspension period. Not more than 100 men are affected by the shutdown.

8,888,888 FORD ENGINE

DETROIT, Dec. 14—Ford engine No. 7,777,777 built June 8, at the Highland Park plant, has given place for sequence of numbers to engine No. 8,888,888, completed Dec. 7 and shipped to the Chicago assembly plant. This represents manufacture of 1,111,111 engines in one day less than six months.

Propose Coloring Gasoline to Insure Safe Handling

U. S. Bureau of Mines Suggests Red Color to Avoid Confusion with Water

WASHINGTON, Dec. 15—Once upon a time an automobile mechanic threw a lighted match into a bucket of gasoline thinking that it was water. The results convinced him of his error but still his alibi was that he thought it was water.

As a result of many such accidents, costing garage men considerable sums of money, the Bureau of Mines has taken a hand in the matter and makes the suggestion that motor gasoline be colored red as a safety measure to guard against similar accidents.

Pointing out that the use of red is considered almost universally as an indication of danger, W. A. Jacobs, chemical engineer of the Bureau, declares that red gasoline would be a sure preventive against motor fuel being mistaken for water.

A precedent has already been set, according to the mine bureau, for in war time the army and navy requires that all gasoline of the so-called "fighting grade" be colored red, to distinguish it from the ordinary motor gasoline.

Seven cents will buy enough dye of a red color to color 1000 gallons of gasoline and the bureau tests show that the dye has no deleterious effect on the gasoline or the engine in which it is burned. Tests made show that one ounce of dye will color 1000 gallons of gasoline instantly and make it a brilliant red, which the Bureau believes will result in a large annual saving to garage men in the reduction of accidents.

Falling Off in Business Shown in R. A. A. Report

NEW YORK, Dec. 15—The report of the Rubber Association of America for the third quarter on the volume of business done and the consumption of crude rubber shows a marked falling off in the value of automobile products in comparison with the first and second quarters.

The total sales value of tires and tire sundries for the third quarter was \$130,562,000 as compared with \$132,818,000 in the second quarter and \$156,908,000 in the first quarter. The big drop came, of course, in the sales value of passenger car and truck tires, which fell off from \$112,515,000 in the second quarter to \$100,707,000. Inner tubes, however, increased from \$17,214,000 to \$19,263,000.

This slump is not unseasonal, though, for figures for 1922 show that whereas the first half of 1923 exceeded the volume for the corresponding period in 1922 by \$6,922,000, it will be necessary only for the fourth quarter this year to produce a volume of \$108,897,000 to equal the figures for the last half of last year.

Consumption of crude rubber in this year's third quarter was 38,426 long tons

in comparison with 65,253 in the second quarter and 72,303 in the first period.

An inventory of crude rubber in the United States and afloat on Sept. 30 shows 85,658 long tons on hand and 24,808 afloat.

Wilson Farewell Dinner Is Attended by Former Workers

DETROIT, Dec. 15—A farewell dinner was tendered William Robert Wilson, who recently resigned as president of the Maxwell-Chalmers companies, at the Detroit Athletic Club, Wednesday evening, by more than 100 of his former associates. Wilson's efforts in building the Maxwell-Chalmers organization into its present strength were praised by the following speakers: Arthur E. Barker, B. E. Hutchinson, W. Ledyard Mitchell, vice presidents of the organization, and by Dr. F. T. Murphy and Allen Edwards, directors. C. W. Hadden, assistant to Wilson for the past two years, presided.

A silver tea service was presented to the guest, inscribed as follows: "Presented to William Robert Wilson in appreciation of his inspiring leadership and as a token of the affection and regard in which he is held by those who worked with him at the Maxwell Motor Corporation."

150 MARMON MEN MEET

INDIANAPOLIS, Dec. 15—The convention of Marmon dealers, distributors and salesmen scheduled for Dec. 10, 11 and 12 of this week, drew about 150 Marmon representatives from the country at large and well attended meetings were held each day. The first day was given over to welcome addresses by Walter C. Marmon, president of Nordyke & Marmon, and others. Tuesday was devoted to special sales and promotion ideas with addresses by dealers and leaders of the organization. Charles Gambill, of Chicago, vice-president of the National Automobile Dealers Association, and long identified with the Chicago distribution of Marmon cars, made a strong plea for better trained salesmen.

ROCHESTER HEARS ADAIR

ROCHESTER, N. Y., Dec. 15—Automotive equipment and tire merchants of this city heard the story of automotive Christmas gift sales promotion at a meeting arranged by a group of jobbers. Neal G. Adair, editor of Motor World, made the talk of the evening, showing the profit opportunity in Christmas merchandising and suggesting effective ways of making the most of the opportunity. Automotive Equipment Association films, "An Automotive Christmas" and "Ask 'Em to Buy," were shown.

PACKARD AT CAPACITY

DETROIT, Dec. 15—Announcement is made by the Packard Motor Car Co. that it is operating to capacity at the present time, the schedule calling for a monthly production of 600 single-eights and 1300 single-sixes. A greater percentage of closed bodies is being produced now than at any time in the company's history.

775 Dealers Gather Dec. 10 for St. Louis District Meet

Moolah Temple Scene of N. A. D. A. and St. Louis Dealers' Association Convention

ST. LOUIS, Dec. 13—Dealers to the number of 775 from Missouri, Illinois, Kentucky, Kansas, Iowa and other points in addition to many from St. Louis and St. Louis County gathered on Dec. 10 at the Moolah Temple at the invitation of the St. Louis Automobile Dealers' Association for a district meeting under the auspices of the National Automobile Dealers' Association. C. A. Vane, manager of the national body, said the meeting was the largest held in the United States under the association.

R. E. Lee presided as chairman and the program which has been followed at the other district meetings throughout the country obtained. The meeting was called to order at 10:30 in the morning and lasted until after 5 o'clock in the evening, with an intermission for luncheon.

The various speakers on the program were given the closest attention and dealers said after the meeting that it had been very instructive and interesting. Carl Baer of the St. Louis Chamber of Commerce spoke in place of F. W. A. Vesper, on the obligations of dealers.

During the luncheon intermission St. Louis distributors gathered together dealers who operate under them in the territory and many private meetings were held. And again in the evening dealers were entertained by their distributors at dinner.

\$1,773,612 Sought for New and Replacement Equipment

WASHINGTON, Dec. 15—For the maintenance of the War Department for the fiscal year of 1925 a total of \$336,441,092 is asked in the budget transmitted this week to Congress by the President. Of the total sum asked \$1,773,612 is for automotive equipment maintenance and for the purchase of new equipment.

The amount asked is \$300,000 more than the automotive equipment expenditures for the fiscal year 1924, but is \$1,000,000 less than for the 1923 expenditures. A total of \$17,000,000 is asked for the 1925 needs for army transportation.

Included in the total sum is an item of \$176,000 for the purchase of new fighting tanks and other self-propelled armored vehicles.

RECEIVER FOR R. H. LONG CO.

BOSTON, Dec. 15—Judge Morton in the equity division of the Superior Court has appointed William W. Caswell ad interim receiver for the R. H. Long Motor Co., manufacturer of the Bay State car. This action was taken on a bill in equity brought by the Butts & Ordway Co., for appointment of a permanent receiver. An order of notice was made returnable Dec. 19.

Willys-Overland Earnings in 1923 to Exceed \$12,000,000

Letter to Stockholders Calls This Year Greatest in History of Company

TOLEDO, Dec. 15—Writing to his stockholders, President John N. Willys states that the net earnings of the Willys-Overland Co. this year have been greater than in any previous year and will exceed \$12,000,000. Continuing, he says that the reduction in the par value of the common stock will make possible the resumption of dividends at an early date, provided, of course, earnings justify such payment.

For the third quarter the company reports net profits, after all charges, including interest and Federal taxes, of \$3,781,256, equivalent to \$17.15 a share on the \$22,049,500 of 7 per cent cumulative preferred stock on which there is an aggregate accumulation in dividends of 19½ per cent, or \$4,244,128. The profits in this quarter compared with \$5,202,918 for the June quarter and \$2,729,468 for the first period, bringing the total for the nine months to \$11,713,642. This is equivalent to \$53.14 a share on the preferred stock and after allowing for the full preferred dividend accumulation the surplus of \$7,469,514 is equal to \$3.45 a share on the 2,159,758 shares of common stock outstanding.

The company has set up a reserve of more than \$3,000,000 for possible inventory depreciation and other contingencies but from present indications it is believed that only a small part of this reserve will be actually used.

Tentative plans for a production of 300,000 cars for next year have been made as compared with an estimated turnout of 200,000 this year, but of course this schedule will depend upon selling conditions next year.

Firestone and Other Experts Will Check U. S. Material

AKRON, O., Dec. 18—Firestone Tire and Rubber Co. crude rubber experts and possibly authorities from other rubber companies will go to Washington next month to assist in checking material gathered by the department of commerce regarding new sources of crude rubber, it has been unofficially announced here.

The department has gathered a large mass of material much of which indicates, according to Firestone officials, that crude rubber will be obtained from new sources in the very near future, and efforts will be made to put this mass of material into shape to report progress made to the Congress which has just gone into session.

The survey was made after Great Britain inaugurated restrictions on export of crude rubber a year ago through the operation of which it was believed that the price of crude rubber would go to new heights.

The operation of the restriction law

did not increase the price of crude rubber and consequently tires as anticipated but it succeeded in causing American makers to attempt through the government to find new sources to make America independent of foreign crude rubber sources.

"Will She Get a Car for Christmas?"

ST. LOUIS, Dec. 15—Acting upon the suggestion of R. E. Lee, manager of the St. Louis Automobile Dealers' Association, dealer establishments in the City of St. Louis have displayed cards bearing the inscription "Will She Get a Car for Christmas?" The signs are 36 x 48 inches and attractively painted in red and green on white beaver board. More than 40 dealers are displaying the uniform sign.

Lee says that reiterated suggestions such as this are of distinct benefit to the holiday trade and it is the intention of the members to use the slogan next year not only on more and larger signs along automobile row but on dealers' promotion letters, in newspaper advertisements, on windshield streamers and elsewhere.

The feeling is general that many sales will be made due to the Christmas season and dealers have installed very attractive window displays for the occasion.

ARRESTED ON FRAUD CHARGE

FALL RIVER, Mass., Dec. 15.—W. B. Gooding, alias H. A. Holt, who sold Rickenbacker and R & V Knight cars here for some months, and disappeared five months ago after which a warrant was issued for his arrest alleging larceny of \$31,000, was taken into custody at Sault St. Marie, Ont. The Thomas Motor Sales Co. is the complainant. Gooding once worked in Providence with an officer of the Thomas company, and this man arranged matters so that the former could go into business here, establishing himself on North Main street. Gooding showed leases purporting that he had sold cars to people on time payments, and the Thomas company arranged with a finance and insurance company to handle the paper. Money was advanced to Gooding to send to the factory in payment for the cars, but it is alleged this was never done. Later on when it was time for payments Gooding disappeared and it was found that most of the 20 cars alleged to have been sold were put through on fraudulent leases to fictitious persons.

TIRE OFFICIALS INDICTED

PHILADELPHIA, Dec. 15—Five officers of the Hydro-United Tire Co., Pottstown, Pa., were indicted here this week, accused of having "jockeyed" the stock of the concern, and engaged in a million-dollar mail enterprise of fraudulent nature. The men indicted are: Jacob G. Feist, John H. Phillips, Augustus Anderson, Philip I. Schaefer and Sidney Linderman.

Condition of Industry Is Described as "Noteworthy"

Federal Reserve Board Finds That Production and Distribution Is at High Rate

WASHINGTON, Dec. 15—Conditions of the automobile industry on Dec. 1 was described as "noteworthy" by the Federal Reserve Board in its monthly summary of business conditions, just made public.

Production and distribution of automobiles continue at a high rate, the Board finds, "despite the approaching end of the usual automobile buying season." The October production increases over September of approximately 37,000 is attributed by the Board to the larger number of working days, "yet the maintenance at previous high rates for so long a time is most noteworthy."

According to data collected in Middle Western States by the Federal reserve banks of Chicago and St. Louis, whole sale distribution of automobiles in November was less than in September and greater than during October of this year. Retail sales showed increases as compared with both of these previous months.

The used-car market also improved somewhat in October, as shown by increases in the number sold, the Board finds. Salable used cars held by dealers, however, were considerably more numerous at the end of October than a month before.

According to October figures, which are the latest available, tire manufacturers for the fourth consecutive month have kept production below shipments, and have therefore somewhat reduced the large stocks held early in the summer. Inventories continue, however, to be unusually large for this time of the year.

Cost of Operating Car on Mileage Basis Told by U. S.

WASHINGTON, Dec. 15—The question as to what is the cost for the operation of an automobile on a mileage basis has for the first time been partially answered by the government.

In preparation of the annual budget for 1925 government experts have figured original costs, depreciation, gasoline, tires, etc., and have declared that the cost per mile for automobiles is 7 cents and for motorcycles 3 cents.

Allowance, however, is made in certain cases, such as mountainous regions, swamps and poor roads, and while the figure may be high in some localities and low in others, the governmental experts figure that the seven cent cost per mile basis is adequate and fair and it has been accepted by the Budget Committee in figuring estimates.

The calculations are based on what is characterized as a moderately priced automobile, being neither the cheapest or the most expensive make.

Salable Merchandise, Character, Capacity, Capital, Essentials of Automobile Dealer

Manager Vane of N. A. D. A., in Striking Bulletin, Discusses Highly Competitive Nature of Business Which He Declares Is Overcrowded With Retailers and Manufacturers

ST. LOUIS, Dec. 15—Stay out of the automobile business! C. A. Vane, in a bulletin to dealers, advises that unless a dealer be able to have first, salable merchandise, second character, third capacity and fourth capital, he had better stay out of the automobile business. He points out that the automotive industry not only for the dealer but the manufacturer as well is the most highly competitive business that the country has ever seen and that selling margins are very low, averaging about 25 per cent for the dealer, while in most other businesses the margin between dealers' buying price and resale price runs from 35 to as high as 100 per cent.

Automobiles are salable merchandise when they are honestly built, fairly priced and efficiently serviced and the proof of this assertion is found in what the public has bought, he says.

Salability, says the bulletin, may be determined by answering these two questions, first what is the history (reputation) of the product in your home city? Second, what is the history of the product in a majority of the principal merchandising centers of the nation?

After explaining in more detail the purpose of these two questions, the bulletin asserts that the automobile industry is over-populated with dealers and manufacturers, and says there are but 10 or 15 lines of cars moving in the average sizable community out of which a

dealer could possibly hope to make a profit, yet in virtually every distributing center there are from 26 to 60 cars represented.

Automobile dealer mortality was 10 per cent in 1919, 12.5 per cent in 1920, 20 per cent in 1921 and 25 per cent in 1922, the bulletin states.

One of the things against which the dealer and prospective dealer should guard is the manufacturer who distributes his new automobiles with a "trading allowance." This practice was condemned by the N. A. D. A. convention in Chicago in January of this year as a fraud and deceit on the buying public and no merchant can hope to remain permanently in business by deceiving the public, Vane declares.

The bulletin concludes with the assertion that the chances of a dealer making a profit with a line that has not already established itself are about 1000 to 1 against him and advises that a dealer who does not handle one of the successful lines or cannot get one of them would be money in his pocket to retire from the business.

The headquarters of the N. A. D. A. has been receiving many letters of commendation on the bulletin from dealers all over the country and one dealer asked that his bankers be sent several copies. The bulletin is regarded as the strongest ever put out by the national association and it is expected to produce quite a lot of comment.

through officials who grab them, and then sell them instead of reporting them to the Government.

BRAKE ASSOCIATION ELECTS

NEW YORK, Dec. 15—The annual meeting of the Asbestos Brake Lining Association, a national organization of manufacturers, was held at the Hotel McAlpin, New York City, on Wednesday, Dec. 12, when the following officers were elected: President, M. F. Judd, of the Raybestos Co.; first vice-president, A. W. Koehler, of the Asbestos Textile Co.; second vice-president, R. J. Stokes, of the Thermoid Rubber Co.; commissioner, A. A. Mowbray, of New York City.

ENDORSE HAYNES BONDS

INDIANAPOLIS, Dec. 15—The State Securities Commission of Indiana this week endorsed the proposal of the Haynes Automobile Co., of Kokomo, to issue bonds totalling \$2,750,000. The bonds consist of first mortgage bonds of \$1,750,000 and \$1,000,000 of income bonds. This clears the way for immediate action on the sale of bonds and securities that is to be started at Kokomo at once.

200 Jobbers Aid A. E. A. Christmas Sales Campaigns

35,000 Sets of Window Streamers Distributed and Being Widely Displayed

CHICAGO, Dec. 15—About 200 of the 225 jobber members of the Automotive Equipment Association have cooperated in the association's automotive Christmas sales campaign. Arthur R. Moggee, merchandising director of the A. E. A., said these jobbers have distributed approximately 35,000 sets of the Christmas window streamers and cards prepared by the merchandising department of the A. E. A.

Some of the jobbers sold this material to dealers at nominal prices and others gave it free with merchandise orders of certain amount. Reports received by the A. E. A. are that the window streamers and cards are being widely displayed by dealers throughout the country.

Reports to the A. E. A. also indicate that the Christmas selling of automotive equipment and accessories is running far ahead of any previous holiday season, thus reflecting the value of the intensive campaign promoted by the A. E. A.

Director Moggee estimates that when the Christmas selling season has closed about 350 dealer meetings will have been held in the United States and Canada in connection with the Christmas campaign. He estimates the attendance at these meetings at 15,000. The largest meeting so far reported was that at St. Louis on Oct. 23 when 650 dealers were present. At all these meetings the moving picture, "An Automotive Christmas," was shown and at many "Ask 'em to Buy" also was exhibited.

Jobbers and manufacturers have cooperated in holding these meetings. One of the most extensive sectional campaigns was that undertaken on the Pacific Coast by the combined jobbers in that territory.

The A. E. A. campaign also has resulted in the decoration of many striking Christmas windows. Photographs of many of these are being entered in the A. E. A. Christmas window contest.

GAIN IN REGISTRATION

INDIANAPOLIS, Dec. 18—With a gain in registration of 110,000 cars and trucks for the registration period ending Dec. 12, 1923, Indiana sales have made a gain of almost 25 per cent over last year's record. Total registration of passenger cars and motor trucks now figure approximately 580,000 against 469,939 for the same date in 1922.

1,300,000 LICENSE SETS

SACRAMENTO, Dec. 17—The California State Motor Vehicle Department has purchased 1,300,000 sets of automobile license plates for 1924. Thus far this year, 1,039,000 automobiles have been registered, and it is expected that by the close of 1923 the registration will reach 1,100,000.

Holds State Can't Seize Liquor Carrying Automobiles

CONCORD, N. H., Dec. 15—Under a decision of the New Hampshire Supreme Court State officers cannot seize motor vehicles for violation of the liquor law, and now some of the city and state officials, who did so, and sold the vehicles are wondering what they must do to make restitution to the owners.

Oscar Nadeau was arrested some time ago charged with violating the liquor law. His car was seized. Then he began a fight, declaring that the law contained no forfeiture clause. Chief Justice Kivil transferred the case to the Supreme Court without a ruling, and now Judge Snow of the Supreme Court decides that "The conclusion is that the legislature did not by the language used intend to provide for the forfeiture of motor vehicles." Judge Parsons, Peaslee and Plummer concurred.

As New Hampshire touches Canada on the north and there is a lot of rum-running from the latter place there have been many stories afloat about how easy it has been to get a motor car cheap

Plans for Service Congress in Detroit Near Completion

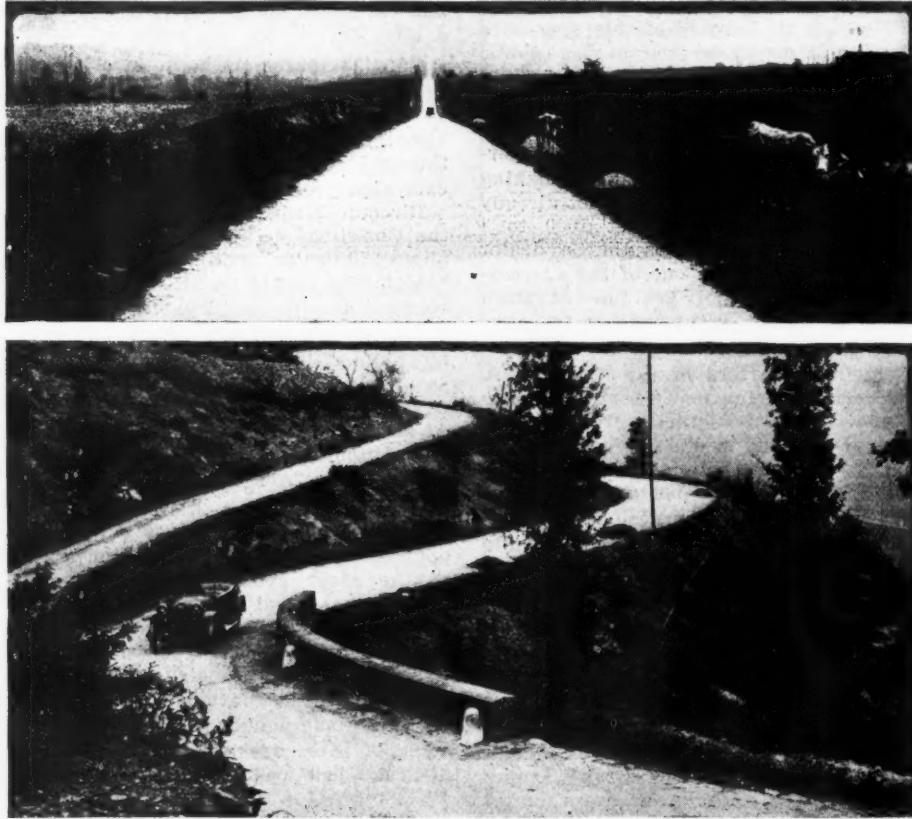
Latter Part of May to Witness Exhibit and Conferences of Manufacturers

NEW YORK, Dec. 15—Plans for the Service Congress to be held in Detroit the latter part of May have progressed to a point where it has been decided to have the exhibit of service equipment open also to the delegates of the World Trade Congress which will be held the latter part of the same week. The plans so far developed call for convention sessions on Tuesday afternoon, Wednesday afternoon and evening and Thursday

afternoon. The remaining morning and afternoons will be available for visits to the exhibition where a great variety of service tools and equipment will be shown in actual operation.

will attend the Service Convention, which will attend the Service convention, which is to be under the auspices of the National Automobile Chamber of Commerce. Invitations will be extended through various organizations to every individual in the country who is directly interested in service work. Speakers of prominence in service and allied branches will be secured. So far it has not been decided what building will be used. It is expected that the Show Committee of the N. A. C. C. will cooperate in the management of the service equipment exhibit.

Views of Next European Grand Prix Course



Hills and Rough Spots Mark European Grand Prix Course

PARIS, Dec. 1 (By Mail)—Variety is not lacking in the 14.3 mile triangular course at Lyons selected for the European Grand Prix 122 cubic inch race to be held on Aug. 3, and for stock car and motorcycle events. The course is a portion of the 23½ mile circuit used for the 1914 French Grand Prix run just before the outbreak of war. By shortening it to a little more than 14 miles the difficulties have been increased, for the cross leg forming the base of the triangle is so hilly and winding that it will considerably reduce the average speed.

The first leg, near the head of which the grandstands will be erected, is level,

only slightly winding, and in consequence will be fast. The second leg will be slow. The first four miles of the third leg are dead straight and being of a switchback nature will permit of the highest possible speeds. At the end of this leg there is a winding down grade to a hairpin turn leading into the grandstand stretch.

In 1914, when the race was open to 274 cubic inch cars, Mercedes secured first three places, the winner's average being 65.5 miles an hour. The 1924 cars of 122 cubic inches piston displacement undoubtedly will be faster than the bigger machines of ten years ago, but it is certain that the average speed will not equal that of previous 122 cubic inch road races held in Europe. The total distance to be covered is 517 miles, being 36 laps of the course.

Perrot Says Equalizers Not Needed in 4-Wheel Brakes

French Inventor Gives Details of Factory to Be Established in South Bend, Ind.

NEW YORK, Dec. 15—Equalizers on four-wheel brakes are neither necessary nor desirable, according to Henri Perrot, designer of Perrot braking systems. Design of front springs is an important element, Perrot says, in determining the effectiveness of front wheel brakes. A set of brakes which is highly effective on one car may prove quite ineffective or unsatisfactory on another car of different design if certain factors, such as spring design and steering layouts, are not correlated properly. A simple form of servo mechanism is desirable because it enables easier brake application, among other reasons, he said.

These are the highpoints which were expressed by the prominent French engineer at a dinner tendered in his honor by Vincent Bendix, to representatives of various American automotive publications here last week.

The dinner was also the occasion for announcing further details concerning the formation of the Perrot Brake Corp. of South Bend, Ind., an organization which will exploit four-wheel brakes in this country and will manufacture, under Perrot patents, control elements and possibly the Farman type of servo shoes for sale to the trade.

Vincent Bendix is president of the new corporation and John R. Cautley is vice-president and general manager, while A. Y. Dodge will serve as chief engineer.

Perrot, who landed in New York last Saturday, will assist the new organization in developing forms of the Perrot system suitable for application to American cars.

Perrot is leaving New York immediately and will visit the new plant in South Bend where suitable tool equipment for parts manufacture already is being installed. He will visit Detroit and other automotive centers, return to New York for the show and later go back to Detroit where he is scheduled to talk at the annual meeting of the Society of Automotive Engineers, Jan. 22-25.

Perrot stated that he now has a total of 70 licenses under his patents, one of these being the General Motors Corp. The new company formed by Bendix will, it is understood, handle all other licenses in this country.

Perrot expressed much interest in various methods for brake testing and in securing authoritative data on coefficients of friction on braking material under various conditions as well as coefficients between tire and road surfaces.

ELGIN AT THE SHOW

INDIANAPOLIS, Dec. 17—Elgin Motors, Inc., announces that it has been granted permission by the management of the National Automobile Shows to exhibit the new Elgin cars at New York and Chicago.

Thomas H. Field, Latest in Car Makers in Wisconsin

New Field Car Sponsored by Early Ford Dealer Will Incorporate Radical Changes

MILWAUKEE, Wis., Dec. 17—Development of a new passenger car industry in Wisconsin has progressed another step since the state railroad commission granted the Field Motor Co. of Rice Lake, Wis., capital stock \$50,000, authority to sell shares. The commission made an exhaustive investigation of the project and after six months' consideration has issued the permit.

Thomas H. Field, one of the earliest Ford dealers in America, who for five years has been perfecting a new design of light car embodying several radical departures from accepted practice, is the head of the new corporation. Pending the grant of a permit to finance the venture, Field has been working on his own funds and voluntary advances from Rice Lake citizens who now become stockholders. The first practical model of the new Field car is now being completed.

The Field car will be powered with a "twin-two" air cooled engine and will carry a novel spring suspension system, with new ideas worked out in transmission and braking systems. Most of the production until now has been done under contract with the O. E. Szekely Co., Moline, Ill.

It is planned to start assembling of cars in Rice Lake about March 1 or April 1. For the time being parts and units will be contracted for. Practically all of the capital of the new corporation has been subscribed for and will suffice to finance the operations planned for the present.

Officers of the new company are: President, T. H. Field; vice-president, J. H. Wallis; secretary, R. C. Peck; treasurer, T. W. Quinn; directors, the officers and George K. Mills.

Wisconsin Ready to Keep Main Roads Free of Snow

MILWAUKEE, Wis., Dec. 17—With the advantage of one of the mildest fall seasons in years, state highway officials, co-operating with county and municipal authorities, have laid plans for the systematic clearing of trunk highways during the coming winter on a scale larger than ever before to meet the needs of the 102 motor bus lines operating in Wisconsin as well as the 425,000 motor vehicles owned within the state. Ordinarily Wisconsin roads are covered with snow by the middle of December, but this year there has not been a snowstorm of any consequence, enabling authorities to proceed with plans for organizing crews without the interruption of emergencies requiring the entire attention.

Milwaukee county, the city of Milwaukee, and most of the suburbs have acquired additional tractor and plow

equipment which is now ready for battles with snow. Until a few years ago the bulk of Milwaukee and Wisconsin motorists laid up their cars when the first heavy snow came. With more and more attention paid to clearing trunk roads, the average Wisconsin motorist now drives 12 months in the year.

Seek Repeal of Excise Tax; Congressman Pledges Help

DES MOINES, Dec. 19—In an effort to secure the repeal of the excise tax on automobiles and parts, S. P. Whiting, secretary of the motor trades bureau of the local chamber of commerce, has written to the Iowa members of Congress, explaining the unfairness of the tax and asking the co-operation of the Iowa legislators to secure repeal of the act during the present session of Congress.

Senator A. B. Cummins, co-author of the Esch-Cummins bill and chairman of the committee on Ways and Means, pledged his unrestricted aid in his reply to Secretary Whiting. In explaining his attitude towards the tax, he wrote, "I voted against the bill when the present law was before Congress. I shall vote to repeal it if the matter comes before us again unless, of course, in the distribution of taxes it is absolutely necessary to retain it in order to maintain the government."

ATLANTA DEALERS ELECT

ATLANTA, Ga., Dec. 17—The annual meeting of the Atlanta Automobile Association was held last week at the Capital City Club, and S. C. Porter, of the Porter-Minehan Co., was elected president for the coming year. Other officers named were J. H. Sommers, of the Packard Enterprises, Inc., first vice president; W. R. C. Smith, second vice president; C. W. Dobbs, of the Dobbs Tire Co., third vice president; J. M. Cochran, of the Eveready Battery Co., fourth vice president; T. K. Johnson, of the General Motors Truck Co., secretary, and Ralph Parker, of the Cadillac Co., treasurer. Both of the latter served in the same offices last year.

F. W. Northcutt, of the Northcutt-Buick Co., retiring president, was presented by the association with a set of silver goblets in appreciation of his services.

OLDS MAKES OWN PARTS

LANSING, Mich., Dec. 18—For the first time in 26 years the Olds Motor Works is now almost exclusively on a basis where everything that goes into its cars is manufactured in its own plant. At this time, the factory executives say, the reorganization of the plant has progressed to the point where within two months the company will be manufacturing more than 90 per cent of everything that goes into its product.

Early last summer the Olds Motor Works started to rebuild its entire plant to produce the lowest priced six cylinder car, and several million dollars were invested in specialized equipment and plant alterations, the whole plant being revamped and greatly improved.

Million Sales Ford Aim for Six Months Ending March 1

To Reach Million Mark for 1923, 259,117 Cars More Than Last Year Must Be Sold

DETROIT, Dec. 15—The Ford Motor Co. has set a mark of 1,000,000 sales for the six months ending March 31, as the goal for its dealer organization to shoot at during the present winter period. In the corresponding six months of 1922 and 1923, the company's dealer organization set up a sales total of 740,883 which represented a 100 per cent gain over the previous year. To reach the million mark this year dealers will have to sell 259,117 more cars than last year.

For some years past the Ford company has been stimulating winter sales activity among its distributing force by the setting up of a sales mark over the usual dull period of the year. Last year the mark fixed was the 100 per cent increase which was achieved. The million mark was set this year as showing a large proportionate gain over last year and one which will give dealers plenty of work but yet within safe striking distance.

In pushing sales during the winter the company has the dual motive of keeping sales high during this period and of lessening the heavy spring buying which would result without large winter sales. The combination of a new line throughout with distinctive closed car models at low prices is expected to make sales go well beyond the million total. Furthermore, the factory will be able to meet the closed car demand much better than in any other year.

Enrollments by dealers under the weekly payment plan will not be included in the 1,000,000 total except where payments are completed and deliveries made during this period.

Production in the six months last year was as follows: October, 121,765; November, 121,968; December, 115,629; January, 111,145; February, 122,994; March, 151,382.

Midwest Tire Manufacturers Discuss Arbiter for Industry

CHICAGO, Dec. 15—At the monthly meeting of the Midwest Rubber Manufacturers' Association this week the topic most discussed was the need of a recognized leader of the industry to regulate activities and adjust controversies which under present conditions are the cause of unprofitable business for many tire manufacturers. The specified suggestion was made that a New York banker who has shown considerable interest in the tire industry should be made arbiter with the same power in the rubber industry that Will Hays has in moving pictures or Judge Landis in baseball.

It was stated that nearly all manufacturers are losing money or failing to make a profit on their Ford size tires which constitute at present about 70 per cent of the production.

CONCERNING MEN YOU KNOW

Ernest A. Bennett has been appointed manager of the newly established Memphis branch of Olds Motor Works. Bennett was for a number of years Overland distributor at South Bend, Ind., and later Indiana distributor for the Dort company, located at Indianapolis. The Memphis Oldsmobile territory will have supervision over western Tennessee, southwestern Kentucky, Mississippi and Arkansas. This new Oldsmobile branch will be located at 1701-1777 Union avenue, Memphis.

M. Lincoln Schuster has resigned his various connections with the Motor and Accessory Manufacturers Association to become president of the firm of Simon & Schuster, publishers, with offices at 37 West Fifty-seventh street, New York City. His associate, Richard L. Simon, now is an executive of Boni & Liveright, New York publishers. In the four years Schuster has been identified with the M. & A. M. A. he has been most active in an executive capacity as assistant to the general manager, M. L. Henninway; manager of the Educational Department, secretary of the Advertising Managers Council and secretary of the Foreign Trade committee. Arrangements have been made whereby he will continue to handle certain features of the educational department work as counsel and adviser and will represent the association in its contact with the press.

Changes in the sales organization of the Biflex Corporation, Waukegan, Ill., bumper manufacturer, are announced. T. J. Leary has joined the organization to work in Chicago. W. H. Taylor will handle sales in Michigan, Indiana and Illinois outside of Chicago. C. J. Colling will cover the states Ohio, Pennsylvania, Maryland, Delaware, Virginia, West Virginia and Kentucky, and the District of Columbia. W. C. Scott has the New England states and New York and New Jersey. O. F. Achtenhagen is the new representative in Florida, Tennessee, Louisiana,

Alabama, Mississippi, Georgia, North Carolina and South Carolina.

Joseph H. Brozek, Detroit, representative of Eco Motors Co., Ltd., of Australia, has departed for a visit to the home office of his company and will not return to Detroit until March.

E. B. Wilson, who resigned as Detroit retail branch manager of Studebaker on Nov. 1, has taken an interest in the Studebaker Sales Co., of Philadelphia. He will be associated with Harry B. Harper, former general sales manager of Studebaker, who recently purchased the Philadelphia distributor's business. He will leave Detroit Dec. 15 to take over his work.

Burton J. Westcott, president of the Westcott Motor Car Co., of Springfield, O., was honored last week by being appointed a member of the board of directors of the Ohio Board of Commerce, the board organized at Columbus. Westcott was formerly mayor of Springfield and is treasurer of The American Seeding Machine Co.

Daniel M. Beal, Moline, Ill., former sales manager for R & V Motor Co., has been appointed division manager for the Studebaker Motor Co., South Bend, Ind. His district includes Michigan, Indiana, Ohio and all states south with distribution at Atlanta, Ga.

A. Wickman, who has been with the Atlanta branch of the Buick Motor Co. for the past 14 years, has been transferred to the new branch established recently by the company at Jacksonville, Fla., as assistant sales manager. The new Jacksonville branch, located at Monroe and Julia streets, was formally opened this month.

I. Walton Schmidt, formerly assistant manager of the field department of the United States Chamber of Commerce, has been added to the staff of the National Automobile Chamber of Commerce as district representative in the Chicago territory. He will make investigations for the industry on economic and market conditions.

Lower Price for Automobile Steel Sheets Is Not Likely

PITTSBURGH, Pa., Dec. 15—It now can be definitely stated that the change in the sheet steel situation precludes the possibility of any reduction in the price of full finished automobile sheets by the leading sheet manufacturers of the country.

There has been the first sign of a revival in the sheet market and the volume of business coming into the steel manufacturers is of so diversified a character, including buying by several automotive interests, that it is gaged as the forerunner of extended purchasing within a month.

CHANDLER PLANS GREATER OUTPUT

CLEVELAND, Dec. 15—Production plans of the Chandler Motor Car Co. for 1924 call for an output of between 22,500 and 25,000 cars, of which 10,000 will be turned out in the first quarter. This is compared to 16,000 cars produced in 11 months of the present year.

The heavy production planned in the first quarter is the result of the experience in the spring of the present year when the company was unable to keep up with the demand. The production would have exceeded the 16,000 cars this year had it not been for conditions in the spring months.

M. & A. M. A. FAVOR TAX CUT

NEW YORK, Dec. 15—Directors of the Motor and Accessory Manufacturers Association have emphatically endorsed Secretary Mellon's program for tax reduction through the adoption of a resolution.

WILL REMOVE SNOW

LOCKPORT, N. Y., Dec. 15—Plans for the removal of snow from the main highways of Niagara county have been completed by the highway committee of the board of supervisors, according to Thomas M. Brennan, county superintendent of highways, in a report filed with the Lockport Automobile club.

The project comprises 100 miles of roads which the county will keep clear of snow. The county has six trucks equipped with snow plows and tractor. Five miles of snow fences will also be used.

OAKES OLD-TIMERS ORGANIZE

INDIANAPOLIS, Dec. 14—The Oakes Company Old-Timers' Club was formally launched at a recent banquet held at the Spink-Arms Hotel, Indianapolis, followed by a theater party.

Five years service is the only requirement for membership and by virtue of having the longest record of service, 11 years, F. E. Glass, sales manager, was named the first president. Thirty-two members were present at the first annual dinner, the combined years of service amounting to 224 years.

VIEW NEW TRUCK MODELS

SPRINGFIELD, O., Dec. 15—Sales representatives of The International Harvester Co., were visitors at the Springfield works where they examined the light high speed motor trucks. They were received and shown about by C. L. Cotner, local sales representative. A banquet was served to 20 agents at Hotel Shawnee.

\$250,000,000 a Year in 1926-28, A. A. S. H. Officials Aim

New Orleans Meeting of Road Men Is Attended by 240 Delegates

NEW ORLEANS, Dec. 15—An endorsement of a larger highway building program and the expenditure of approximately \$250,000,000 a year during 1926-28, was the outstanding feature of the three day meeting of the American Association of State Highway Officials, held in the St. Charles hotel, Dec. 3-6.

During the three-day sessions 240 delegates were in attendance, representing 46 states, Canada and Hawaii. Massachusetts and Washington were the only states not represented.

Many of the sessions were devoted to discussions of Federal relations. A sum of not less than \$100,000,000 a year should be appropriated by the Federal Government for Federal-aid highways and \$10,000,000 a year for forest roads, during the years 1926, 1927 and 1928, was the opinion of the delegates.

The present program of 11,000 miles of surfaced road construction on Federal highway systems, should be maintained during the next four years, it was agreed.

Officers elected for the new year were: President, Fred R. White, chief engineer Iowa State Highway Commission; vice-president, Frank R. Rogers, State Highway Commissioner of Michigan; secretary, Charles M. Upham, State Highway Engineer of North Carolina; treasurer, F. T. Sheets, Superintendent of Highways of Illinois.

AGREE ON COOPERATION

NEW YORK, Dec. 15—The speech that Alfred Reeves made at the annual meeting of the trolley interests at Atlantic City last October, when he extended an invitation to the American Electric Railway Association to co-operate with the National Automobile Chamber of Commerce in legislative and taxation matters, has brought about the desired results. The invitation has been accepted and the A. E. R. A. has appointed a committee to confer with the N. A. C. C., a meeting of both sides has been held and the joint interests now are prepared to map out a policy on legislation, taxation and public utility commissions that will be beneficial to both the bus and the trolley.

CADILLAC SHOWS BIG GAIN

DETROIT, Dec. 15—Cadillac shipments for November were 87 per cent in excess of shipments in November, 1922, and 10 per cent higher than the best previous November. Deliveries at retail were 77 per cent higher, production 58 per cent higher and sales 131 per cent more than November last year. Compared with the corresponding period in the introduction of the type 61 in the fall of 1921, deliveries were 71 per cent higher and production increased 31 per cent. Sales of the V-63 over the type 61 in 11 weeks are 77 per cent higher.

BUSINESS NOTES

The last chapter in the history of the Illinois Tractor Co., of Bloomington, Ill., was written when the personal property was sold at auction, realizing \$12,000. This company was organized seven years ago and a plant constructed in that city. A small number of tractors were manufactured and sold, but the farmers' strike forced a suspension of operations four years ago, and since then the plant has been idle. The money realized from the auction will be distributed among the creditors. A number of truck companies are figuring with the trustee in charge, to buy the plant and commence the manufacture of motor vehicles. A deal may be arranged in the near future which will result in the resumption of operations but with a change in the character of the production.

A bill of foreclosure filed by the Mutual Building and Loan Association against the Dependable Truck & Tractor Co., of Galesburg, Ill., was approved by the Knox county circuit court. The master in chancery's report of evidence and conclusions was filed. This marks the finish of the company organized during the war to manufacture a new type of combination truck and tractor and which attracted much favorable attention.

The Motor Wheel Corporation, of Lansing, Mich., leading manufacturer of motor car wheels, both wood and steel, announces its customary 2 per cent quarterly dividend on the common stock of the corporation. Since the organization of the enterprise in 1920, no dividend period has ever been missed.

The Adria Motor Car Co. plant in Batavia, N. Y., was sold at a foreclosure auction sale to Alexander Gray, president of the Gray Machine and Parts Corp., now joint occupants with the Adria company. The purchase price was \$32,000.

Gotfredson Truck Corp., of Detroit, has located a sales and service branch at Los Angeles as the center of its truck activities on the Pacific Coast. The company will proceed with the development of a nation-wide chain of distribution points, this being a part of this movement. Selection of California as one of the first of them is because of favorable weather conditions for all-year truck use.

Sim Deutsch will head the company which will act as distributor for the Moon Motor Car Co. in Michigan. Offices will be maintained in Detroit from which sales will be directed, the company not engaging in the retail branch of the business. Cars will be shipped from the St. Louis factory to storage points in the state from which they will be released to dealers. Deutsch was at one time vice-president and general manager of Signal Motor Truck Co. Recently he has been vice-president and general manager of Detroit Auto Dash Co.

The M. J. Ford Mfg. Co., of Northumberland, Pa., has taken over the Keystone Forging Co. of that city and henceforth will be known as the Keystone Forging Co. As before the company will continue the manufacture of standard

forgings such as yoke ends, brake rods, etc., for the automotive industry, in addition to making the Gemmer brake rod adjuster which it has developed so successfully.

The Royal Piston Ring Co., at Bath, N. Y., has bought the Everyday Piston Ring Co., at East Rochester, N. Y., and the U. S. Piston Ring Co., of Bath, N. Y. The Royal company will continue to manufacture the Everyday ring. It will be under the management of U. H. Frey.

Manufacture of automobile body fittings, materials and supplies will be undertaken by the Manegold Mfg. Co., of Milwaukee, a new Wisconsin corporation capitalized at \$50,000. The principals are William H. and Frank W. Manegold and Arthur A. Mueller, attorney, 105 Wells street, Milwaukee.

The Steel Products Co., organized with \$100,000 capital at Sheboygan, Wis., to take over and continue the operation of the automobile bumper and equipment business developed by the Jenkins Machine Co. of the same city, has perfected its organization by electing these officers: A. G. Stuedeman, president; Robert C. Ebenerreiter, vice-president; Fred Zschetsche, secretary, treasurer and general manager. The transfer has been effected and the new company is now manufacturing the line, using a part of the Jenkins plant until arrangements are completed for separate and larger quarters.

Formation of the Wausau Motor Parts Mfg. Co., of Wausau, Wis., as already noted, is in effect a reorganization of the Menominee Piston Ring Co., which has disposed of its interests to general manager.

Wausau capital and has moved its factory from Menominee, Mich., to the Wisconsin city. The concern was first organized five years ago to manufacture patented piston ring designed by S. E. Johnson, who is retained by the new owners as factory manager, and has been elected treasurer of the new corporation. E. H. Viele has been elected assistant secretary-treasurer and

Automotive equipment will be manufactured and dealt in at wholesales by the Specialty Mfg. Co., of Rice Lake, Wis., a new \$10,000 corporation organized by Christian, Lloyd J. and Ray L. Frederickson.

The Wald Mfg. Co., 1800 Martin avenue, Sheboygan, Wis., manufacturer of motorcycle and bicycle parts, automotive equipment, tire tools, etc., has accepted the proposition of business men of Maysville, Ky., to move its plant and headquarters to that city on Jan. 1. The Wald company is incorporated in Wisconsin for \$90,000 and will reincorporate in Kentucky with \$125,000 capital to enable it to make proper expansion of plant and production.

The United States Rubber Co. has occupied its new branch building in Springfield, Mass., consisting of four floors and basement, comprising 35,000 sq. ft., all of which it uses. All tires and motor accessories are assembled on the basement floor, with William H. Bechtel in charge of sales for this department. Chester J. Pike is general manager of the branch.

lature asking for permission for Boston to borrow money needed for the new thoroughfare that will parallel Atlantic avenue, the waterfront thoroughfare, and connect the Back Bay, North and South stations thereby relieving the traffic jam which is becoming maddening to drivers of motor vehicles in Boston now. Mayor Curley realized that unless he could get the big merchants to agree with him the legislature never would authorize such a project.

The motor car trade will back up the project.

GARDNER SELLS TO JAPAN

ST. LOUIS, Dec. 15.—The Gardner Motor Car Co. has received the largest single export order it has ever received from Yokohama, Japan. The Gardner factory is located close to the new Government wharf and the cars will be shipped down the Mississippi to the gulf and there transferred to an ocean steamer.

Lansing Motomart Issues 51 Receipts in First Two Weeks

Twenty of These Turned Over for a Cash Value of \$9,055; Open New York Offices

DETROIT, Dec. 15.—In the first two weeks of operation of the Appleby motomart in Lansing, Percy Chamberlain Associates, Inc., reports the issuance of 51 warehouse receipts for cars and the turnover of 20 of these for a cash value of \$9,055. Cars sold were in competition with those remaining in dealer stocks pending the complete turnover of used car business to the motomart.

Cars included in the 51 acceptances were from the public only, those taken over from dealer stocks at motomart appraisal not being included. "We have gone far enough to demonstrate that the proposition can be sold and that the public will do business this way," said H. R. Beals, manager.

An incident to the establishment and operation of the Lansing motomart is a request from a dealer at St. Johns, Mich., (20 miles away), asking the appointment of a resident appraiser at that point because the six dealers there are losing used car business to the Lansing mart. A Grand Ledge, Mich., dealer, 12 miles from the motomart, has asked to join despite the fact that five competitors will continue trading.

New York State offices of Chamberlain Associates have been opened in the Keith Theatre Bldg., Syracuse, in charge of B. G. Jacobs, manager. Indiana offices are in the Guaranty Bldg., Indianapolis, in charge of N. H. Williams.

The Pennsylvania Automotive Association endorsed the Appleby plan and entered into a contract with Chamberlain Associates at a meeting Dec. 3, addressed by J. E. Appleby. The contract was signed by J. D. Arbuckle and R. C. Duffus, president and secretary respectively. Johnstown is the first city in that state to adopt the plan.

London, Ont., has adopted the Appleby plan, the second Canadian city. Bloomington is added to the Illinois group. Frank Craig, former Studebaker dealer at East Jordan, Mich., has been appointed manager of the Vincennes, Ind., mart.

Kentucky Girl Wins National Good Highway Essay Contest

WASHINGTON, Dec. 15.—The Highway Education Board announces that Miss Dorothy Louise Roberts of Harlan, Ky., daughter of a Methodist minister living in the heart of the Kentucky mountains, is the winner of the H. S. Firestone Four Years' University Scholarship, offered for the best essay entered in the fourth annual good roads essay contest. More than 150,000 high school students from all sections of the country submitted essays in this contest. Miss Roberts has elected to take a course in Marietta College at Marietta, O., where her father now is pastor of a local church.

Start Plans for Boston's \$25,000,000 Thoroughfare

BOSTON, Dec. 15.—That Mayor James M. Curley was not talking for effect when he emphasized the needs of meeting the problems involved by the introduction of the motor vehicle when he addressed the convention of the M. & A. M. A. in Boston last September, and made such a hit, is evidenced by his summoning some of the biggest merchants in the Hub to a luncheon a few days ago during which he outlined his project to build a \$25,000,000 broad highway across the city.

George W. Mitton of the Jordan-Marsh Company, L. A. Kirstein of William Filene Sons Company, George B. Johnson of the R. H. White Company, the three big department stores fronting on Washington street in the heart of the city, were among those at the luncheon. As a result of the meeting a bill is being drafted for presentation to the legis-

IN THE RETAIL FIELD

The Dodge business at Webster City, Ia., has been purchased by A. J. Cornwaite, formerly of Rinard, Ia.

The Auto Service Shop is the name of a new concern recently organized at Fonda, Ia., to operate a general automotive repair business and a battery shop. A. J. Burger and Burt Kroesen are members of the firm.

The Macrill-Goodwin-Patch Motor Co., Sioux City, Ia., has been dissolved. Maxwell and Chalmers cars will be handled in the future by the Goodwin Motor Co.

The business of the Calfee Auto Co., Sac City, Iowa, has been purchased by Willard Jennett, a former employee of the company. A. Calfee, who formerly conducted the business, will retire from active business.

The garage business formerly conducted by Van Steenberger, Newton, Iowa, has been taken over by the Bates Chevrolet Co., agents for the Chevrolet in Jasper county.

Wetmore Automobile Co., Sioux City, Ia., dealer for Gray cars in that territory, has taken the agency for Rickenbacker.

C. A. Patch and A. D. Macrill, formerly associated with the Macrill-Goodwin-Patch Co., Sioux City, Ia., have been appointed district distributors for the Steam carburetor.

F. D. Parmer, formerly of the Hayes-Parmer Motor Co., Council Bluffs, Ia., has taken over the entire business and will continue the Ford agency under the name Parmer Motor Co.

Montgomery, Ward & Co., of Chicago, has opened a new retail store in Atlanta at 272 Ivey street, handling exclusively automobile equipment, accessories and supplies and radio goods.

E. F. Phillips, of the Phillips Motor Company, of Burlington, Ia., has discontinued the Chevrolet and Hupmobile agencies and will devote his entire time to the Nash. He will be territory distributor.

Fox Motors, Inc., Cole distributor at Baltimore and associate dealer for Hupmobile, will move about Jan. 1 into new quarters comprising four buildings at 317-319-321-323 Fallsway. The company's present quarters at 1121 Cathedral street have become inadequate for its growing business.

The McCaffrey Motor Co., Ford and Lincoln dealer at Omaha, Neb., will move on Jan. 1 into its new home at Eighteenth and Howard streets. The new building is fireproof and has 58,000 sq. ft. of floor space, affording room for expansion greatly needed by this growing company.

The Belt-Franklin Co., which distributed the Franklin line in central Ohio and which has been located at 224 E. Gay street, Columbus, has acquired by a 99-year lease a lot at Ninth and Broad streets where a future salesroom, offices and service station will be erected. It is planned to erect a three-story building, about 62½ by 187½ ft. and of modern construction. The work will be started early in the spring according to C. O. Belt, head of the company. The cost will be about \$125,000.

The firm of Stuckert & Whitehurst, Overland and Willys-Knight dealer and distributor in the Fort Worth, Tex., territory, has changed hands. The company is now the Whitehurst-Foster Co. The new member of the company is R. E. Foster. The company will continue distributing and selling Overland and Willys-Knight cars in the Fort Worth territory.

The Ormsby Chevrolet Co., of San Antonio, Tex., has been incorporated. The capital stock is \$50,000. Among the incorporators are Frost Woodhull, L. D. Ormsby and W. H. Russell.

The Connell Chevrolet Co., of Post City, Tex., was incorporated last week. The capital stock is \$15,000. Among the incorporators are C. C. Connell, G. W. Connell and F. D. O'Keefe.

T. H. Crawford, of the Batterson & Crawford Tire Co., of Houston, Tex., has bought the interest of his partner, C. K. Batterson, and will conduct the business alone.

The distribution of Indiana Trucks and Ward electrics in Texas has been taken over by Paul R. McMahan, of Dallas. Mr. McMahan has an interest in the same lines at Houston. The new Dallas house will serve the Houston branch with trucks and parts.

The Consolidated Motor Company, 337 East Broadway, Louisville, Ky., has acquired the Gardner franchise in that territory. H. H. Atkins is manager of the company.

The Traub-Schultz Motor Car Co. has been organized at Aurora, Ill., and will open a sales agency and service station at 41-47 South Lake street. John Traub and Charles Schultz are the promoters. Capital stock has been fixed at \$20,000. The new firm will distribute Jewett and Paige cars in the Kane county territory.

H. R. Fitz Henry, Gibson City, Ill., has been appointed distributor for the Buick car in the Ford county territory and has opened up a sales agency and service station at 117 West Eighth street.

The Fawcett Motor Car Sales Co., of Evanston, Ill., has been organized with capital stock of \$1,000. A sales agency has been opened at 1017 Davis street.

The Daubs-Visniski Motor Car Co., Danville, Ill., has commenced the remodeling of the building, vacated by the Barker Motor Car Co., Ford distributor, to move into a newly constructed building. The former company has been appointed distributor of the Buick car in the Vermillion county territory.

The Haywood Brothers Motor Car Co. has been organized at Petersburg, Ill. Capital stock has been fixed at \$40,000. The company will distribute motor vehicles of all kinds and accessories.

The Taylor Motor Car Co. has been organized at Danville, Ill., and will open a garage and sales agency at 252 West Main street. Capital stock has been fixed at \$15,000. Motor cars and accessories will be handled. The promoters are William and Earl Taylor.

Gerald Goodsell last week became sole owner of Allen & Goodsell Motor Co., one of the large authorized Ford dealerships of Portland, Ore., as the result of buying the interest in the firm of Mrs. Pat Allen. The company was formed two years ago by Pat Allen and Goodsell. The former was drowned last summer, and since that time the firm has been run by Goodsell.

Reorganization of the Selden Sales & Service Co., which handles the local distribution of the Selden truck in New York City, has been completed with the naming of A. S. More as president and Harry B. Reynolds as vice-president and general manager. More is president also of the parent Selden Truck Corp., at Rochester, N. Y., while Reynolds has recently been the Selden export manager. Reynolds will continue to act as export manager, in addition to his new duties. Headquarters, as well as sales and service, are located at 238 West 19th street, New York City.

Among new Nash dealers are the following: Barnett Motor Co., Inc., Chicago, Ill.; Nash Auto Sales Co., Dunn, N. C., and W. P. Colvin, Souris, Manitoba.

White-Rollin Motor Co. is a new automobile agency at Lexington, Ky., capitalized at \$20,000, with Shelby T. Harbison, Jr.; Hardin Short and F. D. Yarrington, as incorporators and directors. The company will distribute White trucks and Rollin automobiles in central and eastern Kentucky.

Walter R. Bliss has purchased an interest in the Franklin Motor Car Co. at 616 Commonwealth avenue, Boston. Bliss came to Boston 10 years ago as manager of the Goodyear Tire and Rubber Co.

The following have been appointed as new Cleveland Six distributors: Albert E. Auskins, Mt. Vernon, O.; Chaperon Motor Co., Portland, Ore., and A. A. Ledermann Co., Utica, N. Y.

The Floresville Motor Co., of Floresville, Tex., has been incorporated. The capital stock is \$25,000. Among the incorporators are W. M. Morgan, W. E. Gordon and H. E. Hilderbrand.

Walter A. Kerin, of Springfield, O., has closed a contract by which he will become local distributor for the cars of The Rollin Motors Co., of Cleveland.

K. T. Wiedemann, recent distributor for Duran and Star cars in Minneapolis and St. Paul territory, has been officially announced as the distributor for Moon cars in the entire Northwest territory. Wiedemann was formerly vice-president and general manager of the Gray Motor Co., Studebaker distributor, in St. Paul and Minneapolis, and he also handled the Oldsmobile franchise in St. Paul.

The T. O. Poole & Son Motor Co., Chandler and Winton distributor and one of the oldest automotive concerns in Atlanta, moved this month into the new building constructed for the company at 389 Peachtree street, one of the most modern and completely equipped automobile buildings in Atlanta.

The Ungar-Buick Co., of Lemon City, Fla., Buick dealer in that section of the Florida territory, announced plans this month for the construction of a new \$60,000 building as a permanent home for the company, to include a completely equipped service station, sales and show rooms.

Charles Edwards, Spooner, Wis., is preparing to build a public garage and service building costing about \$18,000.

The Cuba City Motor Co. has been incorporated at Cuba City, Wis., by Albert J. Eustice, George

A. Loeffelholz and Charles H. Bartlett, to do a general automotive sales and service business, operate a garage, etc. The capital stock is \$45,000.

George A. Van Velzer, Elkhorn, Wis., has placed contracts for the erection of a sales and service building, 50 by 80 ft., one story and part basement, costing about \$15,000.

M. J. Goodnetter, 384 Twenty-second street, Milwaukee, has broken ground for a public garage and service building, 30 by 118 ft., at Twenty-sixth street and North avenue.

H. T. Shogren and Chester F. Thomas, Milwaukee, for several months acting as retail dealers in the Peerless at 517 Jefferson street, as the Shogren-Thomas Co., on Dec. 1 were appointed distributors of the Peerless in the southern Wisconsin territory. They will continue to handle Milwaukee county as retail dealers.

The Yunker-Hansen Auto Co., West Allis, Wis., has been appointed retail dealer in the Oldsmobile, continuing also as Chevrolet dealer.

The Wittlin Motor Co., Cedarburg, Wis., has disposed of its public garage, service shop and business to Joseph and Bernard Reichert, of Jackson, Wis., who are continuing the business as the Reichert Motor Co.

George Sladley has retired from the firm of Sladley & Schroeder, Reo dealers at Manitowoc, Wis., and the public garage, sales and service business, including the Reo franchise, has been vested in Harvey Schroeder.

The Central Motor Sales Co., Racine, Wis., has been appointed Star and Durant dealer. It is changing its location from 1535 Douglas avenue to larger quarters at 408 Wisconsin street, in the heart of the Racine business district.

Loiselle Bros., Marshfield, Wis., sustained an estimated loss of \$35,000 by fire which gutted its garage and service building on Dec. 10. Thirty-eight cars were badly damaged. Repairs will be made immediately and the damaged portions rebuilt.

The Downer Garage & Sales Co., 551-557 Downer avenue, Milwaukee, a Hudson and Essex community dealer, has announced the acquisition of Edgar Weirich, a veteran Hudson service man, as service manager.

The Springfield (Mass.) Durant Co. has added Berkshire county to its territory and has appointed sub-dealers for the Durant and Star at these points: W. C. MacClinic, Stockbridge; E. T. Connelly, Great Barrington; Automotive Associates, Inc., Pittsfield; Berk-Lee Garage, Lee; Cheshire Garage, Cheshire; William Orr, North Adams.

The Girard Motor Co. has taken the agency for the Flint in Northampton, Mass.

The Hudson & Essex Co., of Dalton, Mass., headed by Harold F. Messenger, has been formed to take the agency for the Hudson and Essex as local dealers for J. S. Harrington, Inc., Springfield, Mass.

Edward V. Warriner, who with different partners has sold the Stanley steam car in Springfield, Mass., since 1908, has bought out the interest of his recent associate, Henry E. Edmonds, and will continue the business at the present Bliss street stand.

Congressmen Urge National Highways Across Continent

WASHINGTON, Dec. 15—Construction of highways in the western states to connect the west with the east and form trans-continent automotive routes, was approved by a delegation of western representatives in Congress this week, meeting with state and Federal highway officials.

The committee of Congressmen, headed by Harvey M. Toy, chairman of the state Highway Commission of California, submitted its views to officials of the U. S. Bureau of Public Roads with a view of securing government aid.

Congressman Colton of Utah was named chairman of the committee to work for legislation on the project in Washington and to formulate plans. The other members of the committee include Congressmen Summers, Washington; Sinnott, Oregon; Fredericks, California; Leavitt, Montana; Smith, Idaho; Richards, Nevada; Hayden, Arizona; Winter, Wyoming; Valles, Colorado, and Morrow, New Mexico.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Akron, Ohio.....	February	Automobile Dealers Co., Frank O. Neil, Manager.
Albany, N. Y.....	Feb. 16-23.....	Albany Automobile Dealers' Association, J. B. Wood and L. Y. Long, Managers.
Atlanta, Ga.....	Feb. 16-24.....	Atlanta Automobile Association, Virgil W. Shepard, Manager.
Baltimore	Jan. 19-26.....	Baltimore Automobile Dealers' Association, John E. Raine, Secretary.
Birmingham, Ala.....	Dec. 10-12.....	Birmingham News, Jules J. Schwartz, Manager.
Boston, Mass.....	March 8-15.....	Boston Automobile Dealers' Association and the Commercial Motor Vehicle Association, Chester I. Campbell, Manager, 5 Park Square.
Brooklyn	Jan. 19-26.....	Brooklyn Motor Vehicle Dealers' Association.
Buffalo	Jan. 12-19.....	Buffalo Automobile Show Committee, Carlton C. Proctor, Manager.
Calumet, Mich.....	April	Central Storage Co., Jos. A. Savini, Manager.
Camden, N. J.....	March 3-8.....	Camden Automobile Trades Association, M. T. Ivins, Manager.
Charlotte, N. C.....	March 3-8.....	Charlotte Automotive Trades Association, George E. Wilson, Chairman.
Chicago	Jan. 26-Feb. 2.....	N. A. C. C. National Show, Coliseum and First Regiment Armory, S. A. Miles, Manager.
Chicago	Jan. 26-Feb. 2.....	Annual Salon, Drake Hotel.
Cincinnati	Feb. 9-16.....	Cincinnati Automobile Dealers' Association, Harry T. Gardner, Manager.
Cleveland	Jan. 19-26.....	Cleveland Automobile Dealers' and Manufacturers' Association, Herbert Buckman, Manager.
Columbus, Ohio.....	Feb. 4-9.....	Columbus Automobile Dealers Co., Anson B. Coates, Manager.
Dallas, Tex.....	Feb. 11-17.....	Dallas Automobile Trades Association.
Des Moines, Ia.....	Feb. 25-March 1.....	Des Moines Automobile Trades Association, C. G. Van Vleet, Manager.
Detroit, Mich.....	Jan. 19-26.....	Detroit Automobile Dealers' Association, H. H. Shuart, Manager.
Elmira, N. Y.....	Jan. 21-26.....	Elmira Automobile Merchants' Association, T. W. Keeton, Manager.
Goldsboro, N. C.....	April 21-26.....	Chamber of Commerce, W. C. Denmark, Manager.
Grand Rapids, Mich.....	Feb. 25-March 1.....	Passenger Car Dealers' Association, M. D. Elgin, Manager.
Great Falls, Mont.....	March	Montana Automobile Distributors' Association, Lyman E. Jones, Manager.
Green Bay, Wis.....	Aug. 25-30	Automotive Division, Association of Commerce, W. F. Kerwin, Manager.
Greenville, S. C.....	Feb. 25-March 1.....	Greenville Chamber of Commerce.
Hackensack, N. J.....	Jan. 12-19.....	Automotive Trade Association of Bergen County, Moe Katzman, Manager.
Hartford, Conn.....	Feb. 16-23.....	Hartford Automobile Dealers' Association, Arthur Fifoot, Manager.
Huntington, W. Va.....	Feb. 24-29.....	Huntington Automobile Dealers' Association, G. B. Roberson, Manager.
Indianapolis	March 3-8.....	Indianapolis Automobile Trade Association, John B. Orman, Manager.
Kansas City, Mo.....	Feb. 9-16.....	Kansas City Motor Car Dealers' Association, George A. Bond, Secretary.
Louisville, Ky.....	Feb. 18-23.....	Louisville Automobile Dealers' Association, George T. Holmes, Secretary.

Milwaukee	Jan. 19-26.....	Milwaukee Automotive Dealers' Association, Bart J. Ruddle, Manager.
Minneapolis, Minn.....	Feb. 2-9.....	Minneapolis Automobile Trade Association, Walter R. Wilmet, Manager.
Montreal, Canada.....	Jan. 19-26.....	Montreal Automobile Trade Association.
Muskegon, Mich.....	March 4-8.....	Muskegon Automobile Trade Association, J. C. Fowler, Manager.
Newark, N. J.....	Jan. 12-19.....	New Jersey Automobile Exhibition Co., Claud E. Holgate, Manager.
New York	Jan. 5-12.....	N. A. C. C. National Show, Eighth Coast Artillery Armory, S. A. Miles, Manager.
Oakland, Cal.....	Jan. 12-19.....	Alameda County Automotive Trades Association, Robert Martland, Manager.
Omaha, Neb.....	Feb. 18-23.....	Omaha Automobile Trade Association, A. B. Waugh, Manager.
Orlando, Fla.....	Feb. 12-16.....	Subtropical Midwinter Fair Association, C. E. Howard, Manager.
Philadelphia	Jan. 12-19.....	Philadelphia Automobile Trade Association, W. H. Metcalf, Manager.
Pikeville, Ky.....	Jan. 17-19.....	Eastern Kentucky Automobile Show, F. W. Ruddy, Secretary.
Portland, Me.....	Feb. 25-March 1.....	Portland Automobile Dealers' Association, Howard B. Chandler, Manager.
Portland, Ore.....	Feb. 9-15.....	Automobile Dealers' Association of Portland, Ralph J. Steahli, Manager.
Rochester, N. Y.....	Jan. 21-26.....	Rochester Automobile Dealers' Association, S. Park Harman, Manager.
Sacramento, Cal.....	Sept. 1-10.....	State Agricultural Society, C. E. Paine, Manager.
Saginaw, Mich.....	March 4-8.....	Saginaw Automobile Dealers' Association, R. P. Bishop, Secretary.
San Francisco.....	Feb. 16-23.....	San Francisco Automobile Dealers' Association, G. A. Wahlgreen, Manager.
Scranton, Pa.....	Feb. 4-9.....	Scranton Motor Trade Association, Hugh B. Andrews, Manager.
Springfield, Ill.....	March 20-22.....	Springfield Automobile Dealers' Association.
Springfield, Mass.....	March 3-8.....	Springfield Automotive Dealers' Association, Harry W. Stacy, Manager.
St. Louis.....	Feb. 17-24.....	St. Louis Automobile Dealers' Association, Robert E. Lee, Secretary.
Syracuse, N. Y.....	Feb. 25-March 1.....	Syracuse Automobile Dealers' Association, C. H. Hayes, Manager.
Toronto, Ont.....	Aug. 23-Sept. 6.....	Canadian Automotive Equipment Association and the Automotive Industries of Canada, Gib Robertson, Secretary.
Washington, D. C.....	March 8-15.....	Washington Automotive Trade Association, Walter Lambert, Secretary.
Washington Hgts., N. Y.....	March 26-31.....	Washington Heights Automobile Dealers' Association, H. G. Stiles, Manager.
Waterbury, Conn.....	Jan. 14-19.....	Waterbury Automotive Dealers' Association.

CONVENTIONS

Albuquerque, N. M.....	May 26-31.....	U. S. Good Roads Exhibition.
Chicago	Jan. 14-31.....	Good Roads Show.
Detroit, Mich.....	Jan. 23.....	Annual Convention of the Michigan Automotive Trade Association.
Detroit, Mich.....	Jan. 22-25.....	S. A. E. Annual Meeting.
Montgomery, Ala.....	Jan. 21.....	Annual Meeting of the Alabama Automotive Trades Association.
New York City.....	Jan. 5.....	Annual Meeting of the Automotive Electric Association.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

Ford Valves and Engine Knocks

Q—In a Ford engine what is the proper space between the valve stem and tappet?

1—.018 to .030 inches.

2—Will improper seating of the valves cause connecting rods to loosen?

2—There is no direct relation between the fitting of the valves and the loosening of the connecting rod bearings. However, if the fitting of the valves is very poor, so that both the compression and explosion pressures leak out, it will cause missing. Missing in one or more cylinders will cause uneven and jerky action of the engine, which in turn will cause the bearings to loosen up more rapidly than if the engine ran smoothly.

3—To get the best results how wide should the valve seat be?

3—Authorities differ as to the correct width of valve seats. Some maintain that with a very wide seat the unit pressure is low so that leakage might start more easily. You will doubtless find on a Ford engine however, that grinding in the valves with coarse compound followed by fine compound will give satisfactory results. To check the surface you can use a number of pencil marks or else Prussian blue and turn the valve a slight amount to see if you have contact all around.

4—Which will give the best results when properly used, the water grinding compound or the oil mixed compound?

4—We have no recommendations to make as to the kind of compound that would be best, but either one will doubtless do the work.

5—We have had some trouble with the 1923 Ford cars knocking on a pull. We have examined the bearings, ground the valves and doubled the cylinder head gasket and it stopped the trouble for about 150 miles and then the condition returned again.—E. W. Davis Auto Co., Morrill, Kansas.

5—The information given is rather meager to analyze this trouble accurately. There is a possibility however, that in the new engines the piston rings do not fit perfectly and that considerable oil passes up into the combustion chamber causing excessive carbonization. With present day fuel it does not take very much carbon accumulation to make engines knock and we would suggest your cleaning the carbon out when this condition occurs to see if it eliminates the trouble.

On engines which behave in this manner you might also try using Benzol to see if it eliminates the knock and, if so, it shows it to be a fuel or detonation knock, which is always more pronounced in the presence of carbon.

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

contact of the brush with the commutator at the side of the third brush which is toward the ground brush which is at the right side of the car.

A READER'S METHOD OF RELINING FORD BANDS

Referring to the discussion in recent issues of Motor Age on the relining of Ford bands, beg to advise that it is not necessary to loosen the starter from the transmission cover in order to remove the cover, as same with starter attached, will readily come off by bringing up the right side of the cover first. After the right side of the cover clears the engine leg and frame the starter will come out between the flywheel and the edge of the dash.

The cover with the starter attached is replaced in the same manner by letting the left side of the cover go down first but care should be used to see that the starter pinion is back so it will not catch on the flywheel as the cover goes down.

A helper will be required to do a little prying to force the cover off and also to support the starter as the cover is replaced.—Buller Motor Co., Hattiesburg, Miss.

MOTOR AGE wishes to express appreciation for the above suggestion. There appeared several ways of doing the same thing and the more valuable discussion we have on any important question the more help we are going to get and give to each other.

DIRECT CURRENT ARMATURE TESTER WANTED

Q—We are thinking of moving our battery service station into a direct current district. Can you tell us whether we can use the primary of an old Ford coil as an interrupter for our growler? If this will not work, can you tell us what will?—Chicago Subscriber.

You will not be able to use the 110-volt direct current line in your shop, as this voltage will be too high. There is a possibility, however, of using a 6-volt or 12-volt battery, the exact voltage being determined by experiment. The primary of the Ford coil is approximately suitable and, of course, you will have to use it in connection with a vibrator and the condenser. The winding of the growler may not be entirely suitable, but by experiment you may be able to get fair results.

A vibrator that has been found quite suitable for this work is one of the old Delco ignition relays which can be usually picked up for a small sum at any of the auto wrecking establishments.

If you do move into a direct current district and make this experiment, we would appreciate hearing from you as to results obtained when you have tried it first with a 6-volt battery and then with a 12-volt battery.

Garage With Gas Station and Battery Service

Q—Am enclosing a sketch showing a corner location where we are planning on a gas and oil station together with a battery shop and accessories. The idea is not to have a conventional drive-through, but an open space as most gas stations have. We plan on two gas pumps and wheel tanks for oil. We would like to have, if possible, an overhanging roof over the boulevard and have swinging flower baskets and also a short box hedge on the boulevard. In short we want a place of refined beauty but still a place of service. Any criticisms or help will be greatly appreciated.—C. G. Welsh, Montgomery, Ala.

A—We have laid out your filling station and battery service and accessory store on the lot 75x75 ft., rather than on the small one because 60x60 ft. would be altogether too small and there is really not much saved by taking anything between these two sizes. A filling station of this kind must have about 40 ft. on each street to make it hold the cars without having them project onto the sidewalk and obstruct pedestrian traffic.

If this layout were to be built in the north, it might be objectionable on account of being spread out so much and accordingly hard to heat in the winter. No doubt, heat is the least of your worry in Montgomery and the spreading out qualities will give you better ventilation in the hot weather.

There is plenty of room in this yard for four cars in front of the battery service and as many on the other side, if it becomes necessary, still leaving clear space in the center. It would probably be a good plan to pave this whole area with concrete but raise the yard perhaps two or three inches above the driveway to the filling station. This rise would not be so high as to prevent cars from driving into the yard but still it would keep cars using the roadway to the filling station from driving too far out of their course.

We are inclined to believe that you would have a better looking place if you would discard the shelter over the pumps, as it would more or less obstruct the view of the rest of the building.

Architectural Service

IN giving architectural advice, MOTOR AGE Rough pencil sketch showing size and shape of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

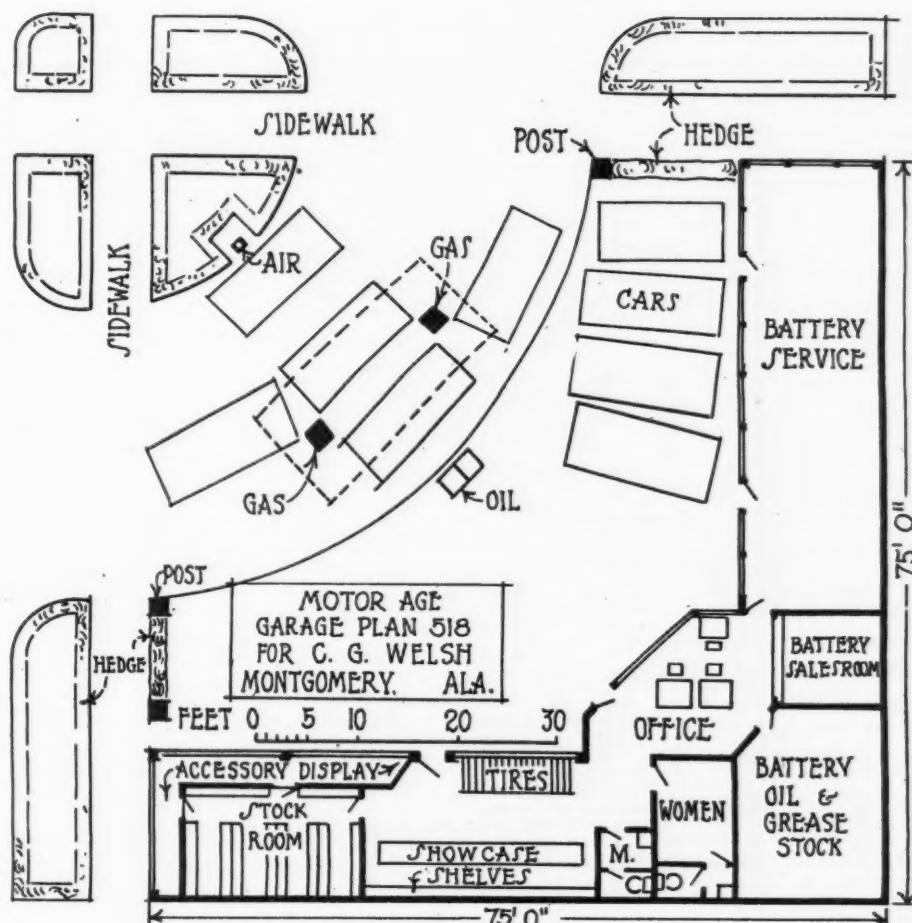
What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.



SLIPPING CLUTCH OR OPEN ARMATURE MAY GIVE LOW CHARGING RATE

Q—We have a Delco generator on a Buick model E35 which will not charge more than 2 amperes, regardless of the third brush setting. New brushes have been installed with no better results. The generator was all right until the engine was overhauled but nothing was touched on the generator. Ever since then 2 amperes is the highest it will charge.—A. D. Stuehm, Peotone, Ill.

The most likely cause of this condition is a slipping clutch at the front end of the generator. You can probably determine this by observing the rotation of the armature while the engine is running. You can possibly judge of the armature speed as the engine speed is increased and decreased and see if you can tell whether the clutch is slipping or not.

Another way to test is to have the engine standing and use a pipe wrench on the pinion at the rear of the starting motor to see if you can turn the armature. In one direction it should turn easily for the clutch allows motion to take place in one direction. However, in the other direction it should not turn and if it does turn without a great deal of effort it shows that the clutch does not hold. Of course in using the pipe wrench you should also use a little discretion with it and do not put enough force on it to strain or bend the shaft.

If the clutch is not the cause of the trouble then it will be found in the winding of the generator portion of the arma-

ture or else in the field. The armature however, is the most likely cause of the trouble if you do not find it in the clutch.

Since receiving this inquiry another letter has been received stating the trouble was due to an open armature.

NEW SET OF TIMING GEARS NEEDED

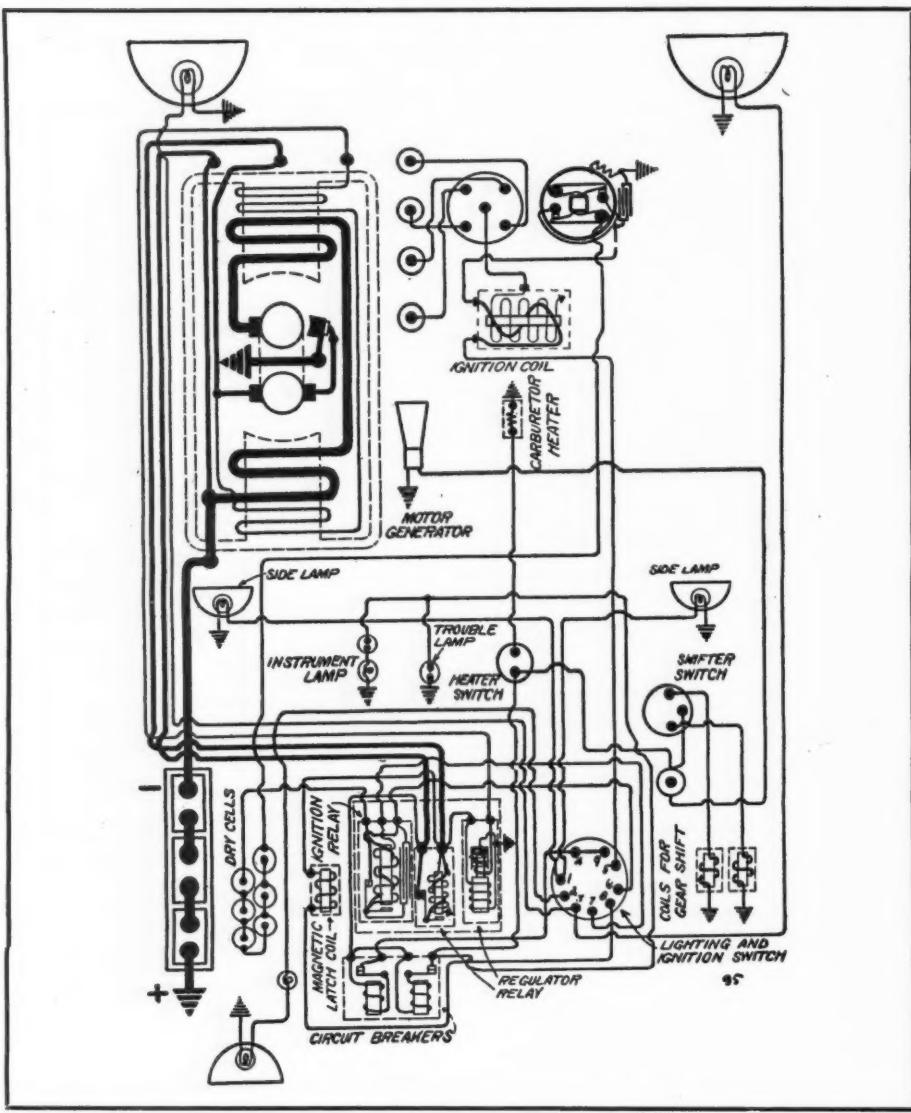
Q—Could you tell me how to overcome the singing noise in the timing gears of most of the 1921 model Oaklands and also some of the older models? New gears do not seem to help. What is the cause of this singing? Would it be advisable to use two fiber gears together, instead of one fiber and one metal, and would that stop the noise?—Reader.

The cure for the timing gear noise in the Oakland models is to discard the present timing gear equipment and install the new timing gear train supplied by the Oakland factory. A new set of gears consists of a metal cam gear and a composition crankshaft pinion and generator gear.

At the time when these gears are installed it is also necessary to install a new generator bushing. The bushing referred to, of course, is the generator drive shaft bushing, which carries the third gear of the train. The gears in question can be secured from any authorized Oakland service station or direct from the factory.

The exact cause of noise coming from the gears is difficult to state, and because of so many factors entering into the theory regarding gear noises that we would not attempt to give a definite reason for the noise.

Wiring and Axle of 1914 Cadillac

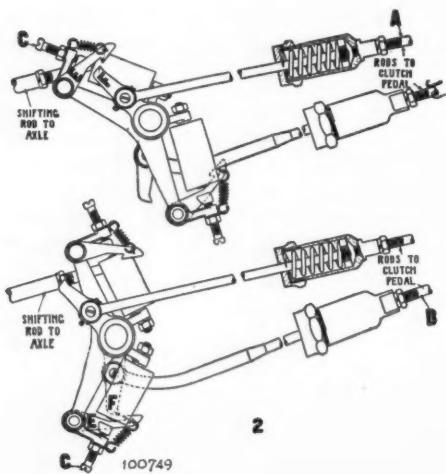


Q—Send me complete wiring diagram of 1914 four cylinder Cadillac.

1—Complete wiring diagram of the 1914 Cadillac is illustrated.

2—This car has two sets of breaker points and as the wiring has been changed I am having trouble getting it properly wired up. Publish a view showing adjustments on two speed rear axle as used on the above car.—Hutchinson-Aldridge Motor Co., Logan, W. Va.

2—Two views of the two speed rear



100749

gear should be moved by securing the gear contact. Information relative to this operation was printed in the Winter Service issue of MOTOR AGE in the article on axles.

Referring to the drawing it will be seen that the large bevel gears "C" and "B" are attached to the gear mount "T" having a hub projecting on each side that fits into the roller bearing. These bearings are carried in sleeves "D" and "E" which are supported in the main carrier "W." The sleeves are threaded on their inner ends to receive the adjusting nuts "D" and "G."

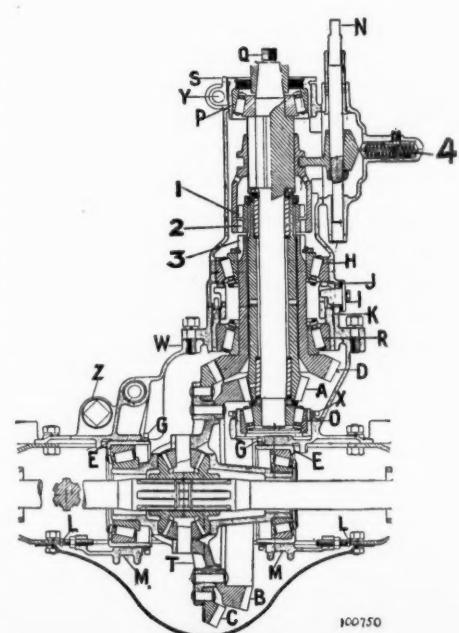
To adjust large bevel gears, first loosen the four bolts that hold the two caps "M" and "M." Draw the locking devices out of the slot in the adjusting nuts "D" and "G" on the sleeve which carries the bearings in the gear mount. The adjusting nuts "G"- "G" can now be turned, moving the gear mount with the gears in either direction as required.

The set screws "L"- "L" in the cap should be adjusted so that they will set only very lightly against the edge of the hole in the housing and then be locked in that position.

SUITABLE CARBURETOR FOR ENGLISH ROVER CAR

Q—We have a 12 h. p. (English rating) Rover here and cannot get a carburetor for it. Would a Ford model Stromberg be too large?—Marinus C. Van Sandwyk, Universal Motor Garage, Ltd., Bloemfontein, O. F. State, South Africa.

The 12 hp. 4-cylinder Rover should require a nominal 1 inch inside diameter carburetor. The Ford model can be used. The O. F. which is the standard Ford model will require different internal specifications as follows: No. 25 venturi, No. 44 reducer economizer. The model O carburetor is similar to the Ford model except that it has a top outlet and the layout of the engine will determine which of these models you should use.



axle are illustrated. Adjustments on this axle are accomplished as follows: If undue end play is found in the pinion "A" remove the clamping bolt "Y" and the key "S" and adjust the bearing "P." Be careful not to adjust the bearings too tightly and after you have adjusted these bearings so that not less than .003 and not more than .005 end play exists reverse the operation on "S" and "Y" and securely lock the adjustment.

If end play is found in the large pinion "D" take off the locking plate "I." This is marked in the illustration and is located farther toward the rear of the axle. This will give access to the adjusting nuts "J" and "K." Hold the adjustment nut "J" and at the same time take up the adjusting nut "K" as far as possible without making the bearings too tight.

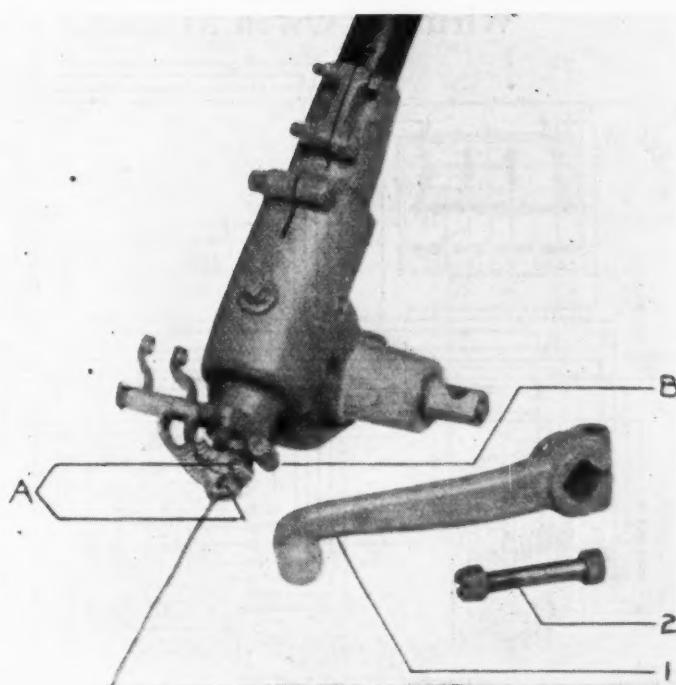
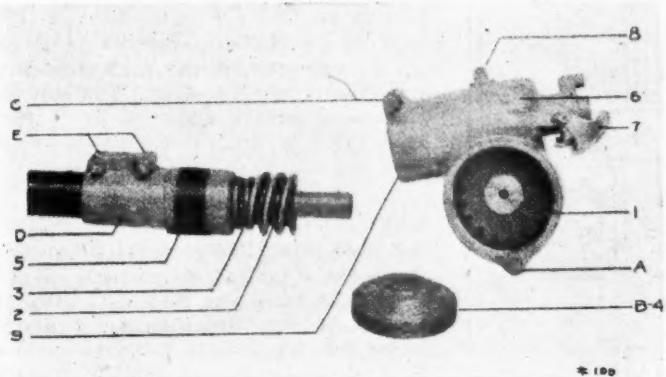
If after following this method it should be found that further adjustment is required to bring either of the pinions into proper mesh, it must first be determined whether it is necessary to move the pinion toward the axle or the large bevel gear toward the pinion or both. This means that you should determine the direction in which the pinion or ring

Steering Gear on 1920 Monroe

Q—We have a Monroe 1920 touring car and the steering wheel has almost a quarter turn lost motion. Advise me as to the make of this gear and where parts may be obtained for it, as we understand this is an orphan car.

The gear used in the 1920 Monroe is known as the C. A. S. Parts for the gear may be obtained from the C. A. S. Mfg. Company, Detroit, Michigan, or direct from the Monroe Motor Company, Indianapolis, Ind.

2—If possible give diagram showing adjustments on above gear.—Edwards Garage, Kennard, Ohio.



2—The C. A. S. gear was thoroughly described in the November 2nd, 1922, issue of MOTOR AGE on page 51. We are reprinting the description with cut.

Adjustment—two adjustments are provided, one to remove the up and down play in the steering column shaft and the other to remove the end play in the wheel or pitman shaft. To remove the up and down play proceed as follows: At the top of the steering gear housing "A," will be found a collar that has notches cut in it. Loosen the bolt holding the collar and turn the collar in a clockwise direction to tighten. Be care-

ful not to draw it up too tightly. Try the adjustment in several positions of the steering wheel. When correct adjustment has been made, lock bolt.

Pitman Shaft End Play Adjustment

Loosen locking device at side of gear by loosening the clamp bolt, then turn large nut No. B4 in clockwise direction to tighten. The large nut is equipped with a countersunk head and the thread is a right handed one. Some models do not have the threaded large nut to take up the worm wheel shaft end play in which case the adjustment is made by

the removal of one or more of the spacing washers which are exposed when the housing plate is removed.

Further adjustment to take up wear between worm and wheel is made as on the other types of worm and wheel gears by removing the ball arm and rotating the wheel through 90 degrees. A new slot will have to be filed in the pitman or wheelshaft to allow for locking the steering ball arm in the new position. Turning the shaft through 90 degrees brings new teeth on the worm wheel into mesh with the worm.

COMPANY MAY BE ORGANIZED BEFORE PATENT IS ISSUED

Q—I have an article on which I have applied for a patent and I wish to organize a company and sell stock and finance it. But in order to organize a company I am told that I will have to wait for my patent. Is this correct?—Kansas Subscriber.

A—You do not have to have a patent before you can organize a company or corporation. As a matter of fact, many of the large companies have valuable patents which they list among their assets at a nominal value only. The value of patents is always uncertain and ultimately the Supreme Court of the U. S. may be required to say whether a patent is invalid or whether it is not an infringement on another.

You may proceed to organize a company to manufacture and sell your device. If all those who buy shares know the full facts of the venture they can then have no cause for complaint if the patent is refused. But suppose some disgruntled shareholders who lose their money in your company charge fraud? Of course, if they have been told everything and you have evidence to that effect, they could not prove fraud.

Again should you proceed to manufacture your device and it turn out to be an

infringement your company could be held liable for all the profits made. But these things do not show it is either wrong in business principle nor illegal to proceed to incorporate and sell stock to finance, for even a patent is not conclusive—merely the opinion of the Patent Office.

But a patent would be evidence, if it should be necessary, that you organized in good faith, sold stock in good faith, even had a basis for putting a value on the patent, and issuing stock therefor.

Now it is a very different matter if you have a plan to sell the patent to the company and issue stock for it. Even this can be done if all the facts are known to a purchaser of the stock. Of course, you cannot sell a patent you haven't yet obtained. But you can assign your interest in the application, or contract to assign the patent if and when issued. The money coming into the hands of the company to finance the company may be used as the management desires in the furtherance of the corporate interests. If it desires to contract with you for the manufacture and sale of your device it may do so.

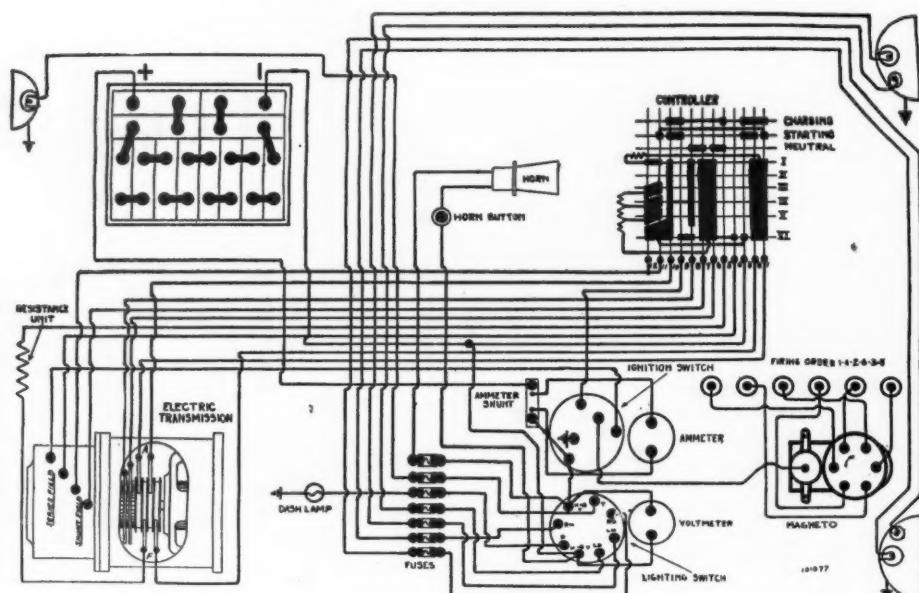
But you may have difficulty if you attempt to be both the seller of your device and the moving official of the corpora-

tion in buying it. At least you might be charged with fraud or the betrayal of the company's interest for your own. Your device, its value, etc., should be passed on by a board of directors whom you do not control, and who understand all the facts.

If the state of incorporation will permit of issuance of stock for your device, the value must be one made in good faith. But you should not issue stock for the device, place this stock in the treasury or otherwise and sell to the public. A patent might never be issued, then you would be charged with fraud; and this whether a fair value has been placed on the proposed device or not.

"How Constant Potential was Discovered at Mudville" is a story which makes clear the theory and practice of constant potential charging even to those who are not expert electricians.

Wiring of Owen Magnetic 1917 Model



Q—Send wiring diagram of Owen Magnetic car model 1917. This car uses a straight assembly 24 volt battery. I am particularly interested in the method of wiring up the battery as I am installing a new battery and the car has no battery

THE CRANKCASE SEEMS TO PRODUCE OIL

Q—We have a Durant 6 cylinder roadster with Ansted motor which has been giving us quite a lot of trouble. The car is practically new, having been run only 3000 miles. We have trouble with the oil rising in the crankcase. When you drain the crankcase entirely dry and flush out the engine, then refill with new oil, up to within $\frac{1}{4}$ inch of the high mark on the gage, and run the car for 300 miles, the oil has risen to the high mark and the longer you run the car the higher it rises on the gage.

We have been changing oil about every three or four hundred miles and putting in new oil, otherwise we would have to draw off some of the oil to keep it from rising too high.

We took the matter up with the Ansted Motor Co., and they stated that it was no doubt caused by too rich a carburetor mixture and that gas was escaping by the piston and entering the crankcase and raising the oil level and advised that we use a leaner mixture.

We have the mixture so lean now that a quick acceleration causes a popping in the carburetor and a continual popping when going down hill with closed throttle or coasting on the level with closed throttle. It pops and splutters but seems to take hold and pull well soon as throttle is opened. The cylinders seem to show considerable wet flaky carbon deposits, compression fairly good.

1—We have been advised by the local Durant service organization that carburetor trouble is the usual cause of the dilution you speak of. We would recommend that you have the carburetor thoroughly overhauled by an authorized Rayfield service station. Providing the carburetor is in good condition and properly adjusted the most probable thing that would produce this dilution would be piston rings that were not properly fitted, or rings that are worn. You state that the compression is fairly good but as a matter of fact the compression

should be perfect in an engine run only 3,000 miles.

In case the overhauling of the carburetor does not eliminate the crankcase dilution we would suggest the installation of a new set of piston rings. Quite often dilution of itself produces poorly fitting rings and loose piston pins and it is possible that this is just what has happened with this engine.

2—We are also having considerable trouble with the clutch. It does not fully release, making gear shifting very difficult and an impossibility without making considerable noise and clashing of gears. When you remove the toe boards and start the motor and release the clutch as far as possible the clutch shaft still revolves but, by placing your other foot on the universal joint between the clutch and gear box and applying 25 or 30 pounds pressure the shaft stops revolving, but starts up immediately when your foot is taken off the universal joint.

We have the clutch adjusted to throw out as far as possible. We even cut an extra notch in the toe board to let the clutch pedal come back farther. We took the clutch out and it seems to be in perfect condition. The discs are not worn a bit and there doesn't seem to be any way to adjust the clutch inside at all. The friction disc at the rear of the clutch is bolted on with three bolts and measuring with a rule shows the disc to be about 1-16 inch higher on one side than the other.

We had thought of grinding the finger on the high side off a little so it would bolt down perfectly level and thought that might help it, but would like your opinion on it first. Is there some adjustment we don't know of? When the clutch is let in it takes a rank hold and almost lifts the car off the ground to say nothing of almost jerking the drivers head off. It seems there certainly must be some way to adjust this clutch, but if there is we have been unable to find it.

2—The first step to make in curing the grabbing of this clutch is to see that all the discs are flat and true, especially

the driven disc which you refer to. If necessary it should be removed and faced off true with the shaft on which it is mounted.

In addition to this it is recommended by the Durant service station that the surface of the clutch facings be reduced in area by chucking them in a lathe and taking a light cut off them. The first cut should be taken about $\frac{1}{4}$ to $\frac{1}{2}$ of an inch in, from the outer edge of the facing and is made to a depth of about $\frac{1}{16}$ of an inch lower than the normal lever of the facing. This groove is cut all the way around, the next step is to move the lathe tool so that you can cut the second groove about $\frac{3}{8}$ or $\frac{1}{2}$ inch from the first groove making it of the same depth.

The theory behind this is that the natural wear of the facings and the lubricant that leaks into the clutch tends to produce a condition of grabbing on the clutch disc faces and that the cutting of grooves in each disc acts as a drain or recess for this foreign material keeping it off of the facings, at point of contact. For best results it is recommended that a comparatively heavy grease be used in the transmission.

3—The timing gears have become quite noisy which seems an unusual occurrence for a car that has only been run so little, what would you suggest might be causing this and a possible remedy?

3—The dilution itself is a possible cause of the premature wear on the timing gears. However, we believe there is one item that perhaps is most important and would suggest that you check it up very carefully. The gears are supposed to run in a spray of oil supplied by a small copper pipe which comes direct to the timing gear case. The end of this copper pipe does not have its full area and is almost closed except that the end is drilled with a No. 54 drill. We would suggest therefore that you carefully examine this oil feed pipe to the timing gear train and see that the hole is open and that it is of sufficient size, which should be the diameter of a No. 54 drill. When the engine is running a constant stream of oil should come from this small orifice in the copper oil pipe.

4—There seems to be quite a perceptible knock in the engine at certain speeds that we have not been able to locate.

4—This is due without a doubt either to the timing gears or to loose piston pins.

5—We understand that one Durant service station has taken off the Rayfield carburetor from a number of Durant 6's and put on the Stromberg. They claim the Rayfield gets out of adjustment too easily, and that it is a hog for gas. The latter fact I can vouch for, but what has been your experience in the matter and would you advise us to put a Stromberg on this car.—Pa. Subscriber.

5—We have been informed by the local Durant service station that they have not as yet been forced to remove any of the original carburetor equipment and that if any trouble arises with the Rayfield carburetor it is corrected by sending the carburetor to a Rayfield authorized repair shop.

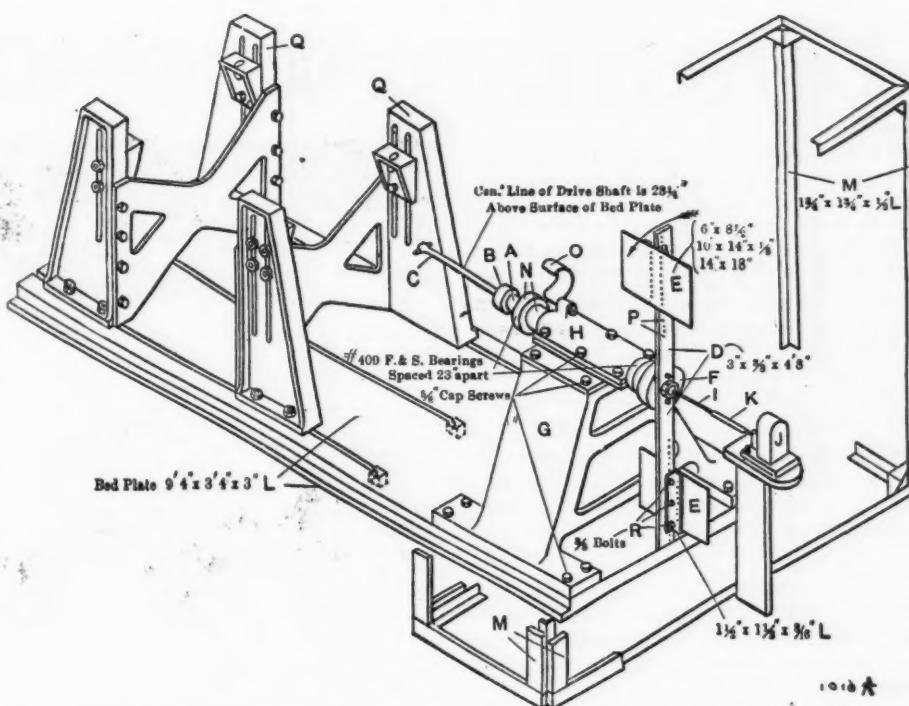
Air Dynamometer for Engine Tests

Q—I would like to have a drawing showing how to build a test stand for automobile engines. I have a burning in machine and test stand which I use in connection with the work I do on racing engines. After they are overhauled I set them in the stand and start them up. After the engines have run for a while I would like to load them up in some way so that they will be doing as much work as they would on the track. The motors are Fronty Fords and I would like some propeller attachment that will enable them to turn about the same r.p.m. as they would when used in the car.—The Kerbs Garage, Otis, Kansas.

The construction of fan dynamometers, as used by the Franklin Automobile Company, is given in S. A. E. data sheets and we are reproducing the illustration which shows the construction, also a chart which gives the h.p. consumed at various speeds, with the fan blades placed at various distances from the center of the shaft.

In the illustration which shows the construction, "A" is the Dynamometer shaft, "B" is the universal joint on "A," "C" is the universal shaft which connects the engine to the dynamometer, "D" indicates the arms of the dynamometer which are constructed of nickel steel.

The fan blades "E" are made of heavy sheet aluminum, having sections of angle iron permanently riveted to the blades, the angles being placed back to back and spaced the thickness of the arm "D." The hub "F" is securely keyed to the shaft and slotted for arm "D" and is made of nickel steel. "G" is a heavy cast iron frame supporting shaft "A." "H" is a cast iron cap for sleeve "N." "I" is an extension of shaft "A," to carry the



tachometer drive. "J" is a Weston electrical tachometer, generator unit.

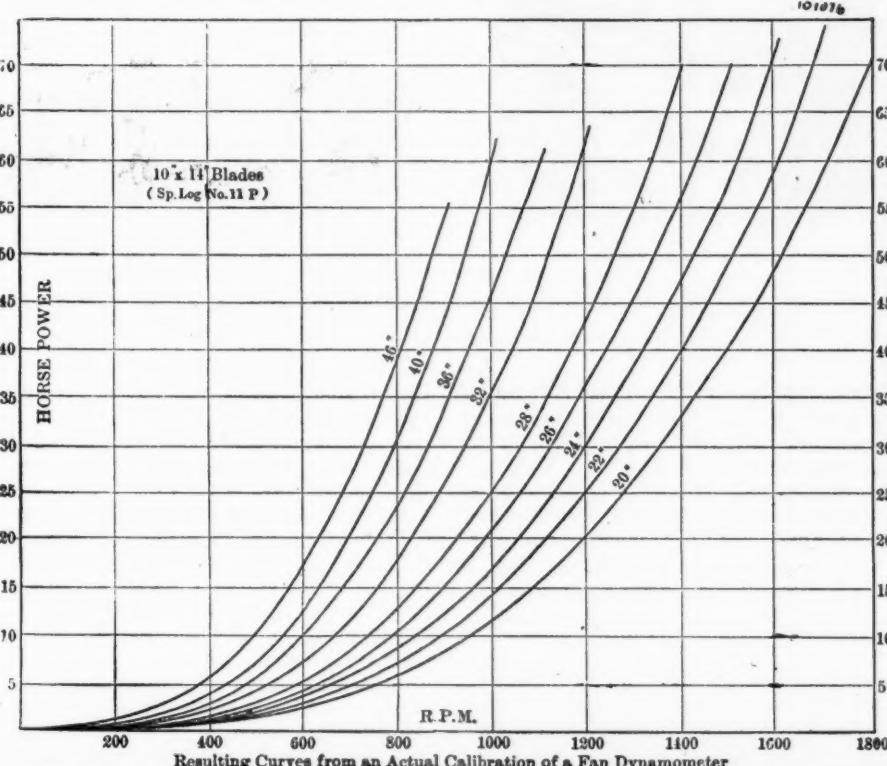
"K" is a flexible connection to the tachometer while "L" is a heavy cast iron bed plate supporting the engine and dynamometer. "M" is a protecting cage made of wire netting while "N" is a cast iron sleeve in which "A" is mounted on heavy annular ball bearings. This cast iron sleeve is slideable endwise to facilitate quick universal connection with engine through "C." It is retained in position when the dynamometer is in use by the hinged clip "O," which then fits

into the space between collar on "N" and the cap "H."

"O" is the hinged clip above referred to. The letter "P" indicates holes in the dynamometer arm for changing the location of the blade "E." "Q" indicates the universal engine stand, easily adaptable to the several sizes of engines produced. "R" indicates nickel steel bolts securing "E" to "D."

As a matter of precaution against the very high stresses that are set up in the dynamometer at high speeds, it has been found advisable to have the arms, hub, and bolts securing the blades to the arm all of 3 1/2 per cent nickel steel. A cage of 1/2 in. mesh wire netting 6 ft. high was also built, enclosing the field of the rotating arms and blades, to prevent accidents.

The proximity of the dynamometer to surrounding objects is of some importance. It should be placed so as to be at least six to eight feet from a side wall or ceiling; that is, there should be considerable free air space all around the field of the rotating blades. The presence of the wire netting cage undoubtedly has some effect on the dynamometer, but as this is a constant and included in the calibration it may be neglected.



NOTE: Radial setting figures appearing on the curves represent distance from center of hub to center of area of blades.

"ENGINEERING FOR THE SERVICE MAN,"
page 23.

What the toggle joint does in brake adjustment.

BOOSTING ACCESSORY SALES

IT is not too early to begin to plan for spring, to think of the advertising and letters that you are going to have to send out to keep apace of other dealers. Nor is it too early to begin planning the tourists' welcome for this spring and summer will bring a greater number of tourists into all parts of the country than ever before. This page will keep you informed, every week, on the new and practical accessories which will increase your sales.

The Hycoe Brake Lining is made by the Manhattan Rubber Mfg. Co., Passaic, N. J. It is of the folded and stitched hydraulic compressed type but embodying many improvements.

The Rich Glass Enclosure consists of compact sides or sections that fit, wind and weather proof from windshield to back curtain. By using the touring top, the touring car lines are retained and the weight of the car is increased only slightly. Stock jobs to fit Willys-Knight, Chevrolet, Overland and Oldsmobile touring cars are carried at \$85 while the Ford enclosure costs \$75. The Rich Mfg. Co., Sterling, Ill., is the manufacturer.

The Braced Bumper Co., 6111 Winthrop avenue, Chicago, has brought out the Bi-Braced Bi-Bumper shown in the cut on this page, the feature of which is its method of attachment to the car which eliminates much of the adverse centrifugal pull in quick turns and sharp curves.

Woodlites are a new type of automobile head lamp. They are fitted with lens which are focused to the road and do not glare. They are made by the Woodlite Corp., 486 California street, San Francisco.

The Stone Extra Spare Tire Carriers attach to the rim of the tire already on the spare tire carrier. Two types are made—the lug type and universal, the former being especially adapted to Ford cars. The carrier fits all rims and sells in sets of three for \$1 or for 35 cents each. The Stone Mfg. Co., 1502 Michigan avenue, Chicago, is the manufacturer.

The Hard Rubber Throttle Extension sells at 20 cents and is fitted to the throttles of the Ford cars equipped with oversize steering wheels, bringing the control to convenient reach of the operator. The Midwest Rubber Co., E. 18 and Chester avenue, Cleveland, is the maker.

An announcement for spring comes from the Geo. B. Carpenter Co., 440 N. Wells street, Chicago, in the Presto tent, the chief feature of which is the quickness with which it can be assembled, without poles, using the automobile for a support. With poles, the tent can be erected as shown in the cut. The weight of the Presto tent is 35 lbs., the size, when packed, is 48 by 12 ins. It can be



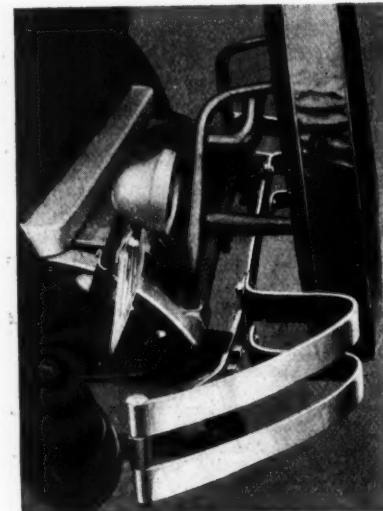
Stone extra spare tire carrier



Fyrac night guide



Woodlites



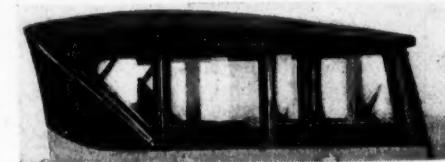
Eaton bumperettes



Presto tent



Bi-Braced Bi-Bumper



Rich glass enclosure

carried on the running board of the car in a water proof bag which is included in the price, \$22.

Eaton "Bumperets," a special form of protection for the rear, have just been announced by the bumper division of The Eaton Axle & Spring Company, Cleveland. These may be described as two segments of a bumper, which when installed, protect the rear fenders.

They are set eight to ten inches closer to the car than the ordinary bumper, it is claimed, making it easier to get at spare tires, trunk, luggage deck, rear grease cups, or to jack up rear wheels, while less space is required for parking.

Made of the same quality of molybdenum steel as other Eaton bumpers, the "Bumperets" are firmly braced with a broad connecting bar which helps to

distribute a blow received on one side, and holds the bumperets in alignment.

Announcement of the Fyrac Night Guide is made by the Fyrac Manufacturing Company, Rockford, Illinois. The new Night Guide in the company's announcement is called "The Super Spot-light."

It fits through the windshield glass, is operated from within the car with the reflector out in front. The most striking feature of the new device is the Gun-Grip. This handle is in the shape of an actual revolver grip and is very convenient for quick use.

The advantages of the Fyrac Night Guide are the facts that it is always ready for instant use, is never hampered by curtains or closed windows and is capable of shooting a 1,500 foot beam in any direction.

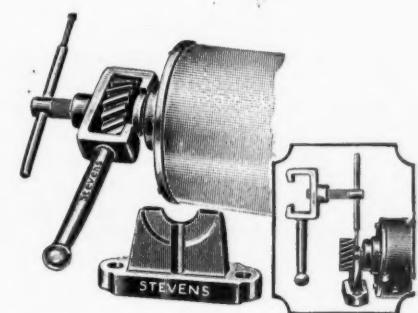
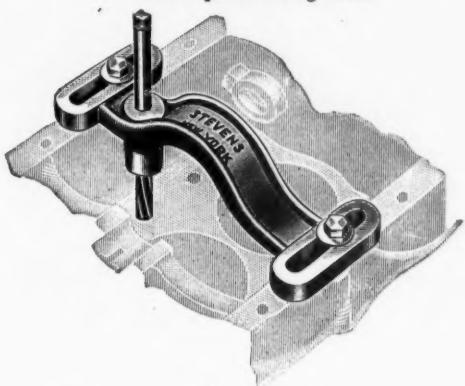
GETTING MORE OUT of the SHOP



Shell piston ring vice



Munson wheel puller

Above—Stevens push rod reamer and jig
Below—Stevens generator gear puller

If a car has been in storage during the winter or if it has been driven, it will need attention in the spring. It will need many new parts and perhaps a thorough overhauling. Now is the time to get ready to do that work—to install the new equipment which will be necessary. More than that, you will have to go over again, the assurances of your ability to do the work. If you are the only repairman within five hundred miles of your place, you will not have to do much advertising, but if there is another or many others, you will have to be just one step ahead of them all the way.

You will have to get your story before the people first and in the most complete and interesting form. Letters and newspaper ads are, perhaps, the most effective way of doing this. If you find work slackened a bit, at this time, go out and make a check on your territory. Find out who the people are who have been using their cars and who have stored them.

Then when you come to preparing letters, you can address a man, knowing just what he has done with his car during the winter. Of course, winter work is not by any means over yet, but you can at least plan for the spring. You



Storm automatic hone

can equip your shop to take care of tourist business this summer, for, no matter where you are, motor tourists will be through your community all summer long. Motor clubs in the larger cities are mapping all sorts of tours for people to take and they are not neglecting your town.

Co-operate with the other merchants to be ready to get this business and get organized to weed out those who would be dishonest with tourists. One of your biggest sources of profit this summer will come from tourist trade—don't fail to get into it right. Don't tolerate those merchants who are going to practice gyping.

Two new Stevens tools have been announced—the Stevens Generator Gear Puller and the new Stevens Push Rod Reamer and Jig.

The Stevens Generator Gear Puller for Fords is shown in the cut on this page. The feature of this tool is the convenience with which it may be used. The body of it is drop forged, the punch is made of machine steel. The block takes the strain off the bearings when removing or inserting pin and is grooved to receive pin. It can be permanently fastened to a bench, if desired. The price

is \$2 and it is made by Stevens & Co., 375 Broadway, New York.

The new Stevens Push Rod Reamer and Jig for Fords, clamps both sides of the cylinder base. This secures the jig firmly to the base and insures fullest accuracy even when the sides of the base have been strained through rough handling. The reamer is chamfered slightly at the end in order to start it correctly in the push rod hole and to adjust the jig in true position before bolting it down. The oversize push rod reamer and jig sell at \$4.50; the jig alone, \$2.50 and the special reamer for jig, \$2.35. Stevens & Co., 375 Broadway, New York, is the maker.

The Storm Automatic Hone provides a means of driving and feeding the Storm Patented Hone at a feed and speed that have been found to give best results.

Its principal features over hand operated tools are: speed and efficiency in operation,—perfect "Gun Barrell" finish produced uniformly throughout the cylinder, wide range of capacity, proper, even speed and feed, absolute self-centering and perfect balance of pressure.

In operating the head is simply inserted in the cylinder, the collar is set for automatic reverse at the proper point and the motor is started. The head centers the machine above the bore and the head is fed forth and back at the proper rate of speed without further attention. A very useful tool for resizing cylinders and for fitting the small standard oversizes. It is also adapted to the needs of the shop that does boring, reaming or grinding—for putting a "Gun Barrel" finish on the cylinders after the previous machining operations. Storm Mfg. Co., Minneapolis, Minn.

The body of the Munson Wheel Puller is made extra heavy for heavy duty, the clamping screws are seven-sixteenths in. chrome nickel one on each side and when drawn up tight give a positive lock on the hub thread. The main screw is one and one-quarter ins. in diameter and is made of special screw stock and case hardened. Type A, shown in the cut is made in various sizes to fit different makes of cars and Type B is made in two sizes, two and one-quarter ins. and two and three-quarters ins. opening for cars having necked hubs. They are made by E. G. Munson, Utica, N. Y.

The Shell Piston Ring Vice is a device for holding piston rings while fitting or filing them. The tool is clamped vertically in a vise by means of the strips extending below for miter cut rings. The ring is placed in the groove of the circular band. This makes it possible to work upon the bands, either to fit or file them. Lester Shell, Hopkins, Mo., is the manufacturer.

SQUEEKS & RATTLES

A HIGHER score in '24!

The New Year is at hand and with it comes the job of electing a new president. Lew Brication regrets that he cannot become a candidate, being a good friend of at least four of the possibilities, he does not wish to shatter their life's dreams by handing them the defeat that would surely be theirs, were he to throw his hat in the ring.

And besides, he has only one hat and needs that these cold days.

It wouldn't fit in the ring anyway—it's square and would crowd all the others out.

Squeeks & Rattles, however, will remain as always—neutral on the subject of politics. We have no choice but may the guy who grants the soldiers their bonus immediately after his inauguration address, get the job.

TO say nothing of heavy shipments of light wines and beers.

OR of the war tax on automobiles. Some day, somebody in authority in Washington will pick up a paper and read where an armistice, declaring the war at an end, was signed November 11, 1918.

THEN they'll be wondering why General Pershing isn't coming home.

OLAF says, "Selling cars is one thing but teaching a lady owner to drive is about two thousand things which wouldn't look good in print or anywhere else."

ONCE a man complained that the factory was slow in answering his letter about valve timing. Perhaps they gave it to him by degrees.

TEACHER (after talking to class of mechanics on power, velocity and speed): "Joe, what is speed?"

Joe: "Speed is what a fellow lets go of a bee with."

Weakly Korexpondenth

editor thqek & ratelth
deer lew

thum dam fool got to munkying with my tiperiter latth nite and nocked of the litel jiger wot hath the eth on it tho thith wealth korexpondenth wil be ful of lithpth. yeth i no ith harderenel to reed but beleve me lew ith a damthite harder to thpel & lord noth thatth hard enuf enyhow. no other newth thith weak an ever if ther wath i koodnt thend it lithping thith way.

yurth
axel ththand

walnut korner ark

Last Week's Headlines
"Danville Adopts Appleby."—Poor Appleby.
"9,000,000th Ford in Sight."—And everyone's doing well.

400 Safe Drivers

BALTIMORE, Md., Dec. 8.—Almost 400 motor car drivers who attended the second Safe Driver's School conducted by the Baltimore Safety Council were given diplomas on Dec. 4. * * * thus runs a news item in a recent publication. This is apt to cause some dissatisfaction on the part of the guys who have been trying so hard to earn a diploma or something, killing people.

"Kay Em" Roberts will now rise and sing a passage from something-or-other that we can print on this here sheet next week.

You are all invited to jine in the chorus.

Our song of sobs remains the same; now high, then low, but always the same, "Help, Help!"

O. E. Gundstrom has neglected us something shameful here of late.

WELL, thank heavens, that's over," said father as he footed the Christmas bills and packed up what the collectors hadn't taken and prepared to leave for the poor house.

AND now that it is over, don't let the Christmas decorations hang around in the window until the fourth of July.

IF you do, every time a guy goes by and looks in, he'll think of the money it cost him to get by for Christmas and he'll agree with himself that he can't ever afford a car.

IS there any reason why you shouldn't be writing us something that we can print on this page next week?

IF there is, send us the reason; we'll print that.

AFTER all of the low priced sixes and fours and what-nots are finally put on the market, pretty near every car owner will be his own dealer and distributor.

BUT the maintenance man will still be able to make money.

Fable

There once was a lady who drove down Michigan avenue, Chicago, and didn't have an argument with a traffic cop.

Then the Wheel Spoke

The piston said, I fit too tight
The oil is getting rank
I'd really like to be relieved
It's hard to move a crank.

The crank case said, I'm full of dust
And sand and grit and sod
So she don't boil, put in new oil
To cool, and spare the rod—HAP.

All right, let's go and let's all go together and make it
A Higher Score in '24!

LEW BRICATION.

Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE			REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	ENGINE			REAR AXLE		TIRES			
			Bore & Stroke	Make & Model	Clutch Make	Gearset Make	Final Drive	Front	Rear			Bore & Stroke	Make & Model	Clutch Make	Gearset Make	Final Drive	Front	Rear		
Acme.....20 ^{3/4-1}	Co-N.	33x45	B&B.	Cot.	Ti-6250.	WO.	34x5	34x5n		Dorris.....K2 ¹	\$2490	Own.	4x5 ^{1/2}	Own.	War.	Ti-5512.	IG.	33x5n	33x5n	
Acme.....30 ^{1-11/2}	Co-J4.	33x45	B&B.	Cot.	Ti-6352.	WO.	34x3 ^{1/2}	34x5		Dorris.....K4 ^{2 1/2}	3400	Own.	4x4 ^{1/2}	Own.	War.	Ti-6560.	WO.	36x4	36x7	
Acme.....40 ^{1 1/2-2}	Co-J4.	33x45	B&B.	Cot.	Ti-6180.	WO.	34x3 ^{1/2}	34x5		Dorris.....K7 ^{3 1/2}	4400	Own.	4x4 ^{1/2}	Own.	War.	Ti-6660.	WO.	36x7	36x10	
Acme.....50 ^{2 1/2-3}	Co-K4.	43x5 ^{1/2}	B&B.	Cot.	Ti-6560.	WO.	36x4	36x7		Dort.....10 ^{3 1/2}	685b	Ly-K.	34x5 ^{1/2}	Del.	Own.	Fl-105.	SB.	31x4n	31x4n	
Acme.....50 ^{3 1/2-4}	Co-J4.	43x5 ^{1/2}	B&B.	Cot.	Ti-6660.	WO.	36x5	40x10		Duplex.....G ^{1 1/2}	Bu-WTU	33x4 ^{1/2}	B-L.	Cov.	Sh-151.	SB.	33x5	33x5n		
Acme.....125 ^{3 1/2-4}	Co-B5.	43x6	B&B.	Cot.	Ti-6700.	WO.	36x6	40x12		Duplex.....GH ^{1 1/2}	Bu-WTU	33x4 ^{1/2}	Cov.	Cov.	Sh-151.	WO.	35x6	36x6		
Amer. La France ^{2 1/2-3}	Own.	43x6	Own.	Own.	DR.	36x4	36x7		Duplex.....G ^{1 1/2}	Bu-WTU	33x4 ^{1/2}	Cov.	Cov.	Sh-103.	WO.	35x6n	35x7n			
Amer. La France ^{2 1/2-3}	4950	Own.	1 1/2x6	Own.	Own.	WO.	36x5	36x5		Duplex.....AC ^{2 1/2-3}	Hi-400.	4x5 ^{1/2}	B-L.	Vu-4.	WO.	34x5	36x8			
Amer. La France ^{2 1/2-3}	5500	Own.	1 1/2x6	Own.	Own.	WO.	36x6	40x6		Duplex.....E ^{3 1/2}	Hi-400.	4x5 ^{1/2}	B-L.	Own.	IG.	36x8	36x8			
Armeleder.....21 ^{1 1/2-2}	Bu-37TU	4x5 ^{1/2}	Ful.	Ful.	Ti-6160.	WO.	31x3 ^{1/2}	34x6k		F. W. D. ....B ³	4200	Wi-A.	4x5 ^{1/2}	H-S.	Cot.	Own.	SP.	36x6	36x6	
Armeleder.....HWB ^{2 1/2-3}	Bu-HTU	4x5 ^{1/2}	B-L.	B-L.	Ti-6560.	WO.	36x4	36x4k		Fageol. ....1 ^{1/2}	3000	Wa-YA.	33x4 ^{1/2}	B-L.	Cot.	Ti-6461.	WO.	34x3 ^{1/2}	34x6	
Armeleder.....HWC ^{2 1/2-3}	Co-C4.	43x5 ^{1/2}	B-L.	B-L.	Ti-6660.	WO.	36x4	36x4k		Fageol. ....2 ^{1/2}	3900	Wa-CU.	43x5 ^{1/2}	B-L.	Own.	Ti-6560.	WO.	34x4k	36x7	
Armeleder.....KWB ^{3 1/2-4}	Bu-YTU	43x5 ^{1/2}	B-L.	B-L.	Ti-6666.	WO.	36x5k	36x5k		Fageol. ....6	5000	Wa-DU.	41x2 ^{1/2}	B-L.	Own.	Ti-6666.	WO.	36x5	36x5d	
Armeleder.....KWC ^{3 1/2-4}	Co-E4.	43x5 ^{1/2}	B-L.	B-L.	Ti-6666.	WO.	36x5k	36x5k		Fageol. ....6	5700	Wa-DU.	41x2 ^{1/2}	B-L.	Own.	Ti-6700.	WO.	36x6	40x6d	
Atterbury.....20R ^{1 1/2-2}	2475	Co-J4.	33x5	Ful.	Ful.	Ti-6160.	WO.	31x4k	34x6k		Federal....R ¹	33x45	B&B.	Det.	Ti-6250.	WO.	33x5n	33x5n		
Atterbury.....22C ^{2 1/2-3}	3375b	Co-K4.	43x5 ^{1/2}	B-L.	B-L.	Ti-6560.	WO.	36x4	36x4k		Federal....S-23 ^{1 1/2}	Co-J4.	33x45	B&B.	B&B.	Own.	W.	36x3 ^{1/2}	36x5	
Atterbury.....22D ^{3 1/2-4}	4275b	Co-L4.	43x5 ^{1/2}	B-L.	B-L.	Ti-6666.	WO.	36x5	40x7d		Federal....U ^{2 1/2}	Co-K4.	43x5 ^{1/2}	B&B.	B&B.	War.	Ti-6560.	WO.	36x4	36x8
Autocar.....21 ^{1 1/2-2}	2200	Own.	43x5 ^{1/2}	Own.	Own.	DR.	31x4	34x6		Federal....W ^{3 1/2-4}	Co-L4.	43x5 ^{1/2}	B&B.	War.	Ti-6666.	WO.	36x5	40x5d		
Autocar.....27 ^{2 1/2-3}	3450	Own.	43x5 ^{1/2}	Own.	Own.	DR.	31x5	36x8		Federal....X ⁵⁻⁰	Co-B5.	43x6	B&B.	War.	Ti-6700.	WO.	36x6	40x6d		
Autocar.....Available	4650	Own.	1 1/2x5	Own.	Own.	DR.	31x6	36x12		Ford....T ¹	370	Own.	33x44	Own.	Own.	Own.	W.	30x3 ^{1/2}	32x4 ^{1/2}	
Available.....JH ^{1 1/2-2}	2180	He-O.	4x5	B-L.	B-L.	Ti-6160.	WO.	30x3 ^{1/2}	36x5		G.M.C. ....K16 ¹	Own.	31x5 ^{1/2}	Own.	Own.	Own.	SB.	34x5n	34x5n	
Available.....H ^{1 1/2-2}	3160	He-O.	4x5	B-L.	B-L.	Ti-6560.	WO.	36x4	36x8		G.M.C. ....K41 ¹	Own.	33x5	Own.	Own.	Own.	W.	36x4	36x7	
Available.....H ^{3 1/2-4}	4175	He-MU3	1 1/2x5 ^{1/2}	B-L.	B-L.	Ti-6666.	WO.	36x5	40x5d		G.M.C. ....K71 ¹⁰	Own.	41x2 ^{1/2}	Own.	Own.	Own.	W.	36x5	40x5d	
Available.....H ⁵	5375	He-T3.	5x6	B-L.	B-L.	Ti-6700.	WO.	36x6	40x7d		G.M.C. ....K101 ⁵	Own.	41x2 ^{1/2}	Own.	Own.	Own.	W.	36x5	40x6d	
Avery.....1-1/4	945	Own.	3x4	Own.	Own.	To-X2.	IG.	31x5n	34x5n		G.M.C. ....K101 ¹⁵	Own.	41x2 ^{1/2}	Own.	Own.	Own.	W.	36x5	40x14	
Bessemer.....G ¹	1450	Co-N.	31x45	Ful.	Ful.	To-A.	IG.	35x5n	35x5n		Garford....F ¹	151	1590	Bu-MU.	B-L.	Own.	Ti-6250.	WO.	34x5n	34x5n
Bessemer.....H2 ^{1 1/2-2}	1995	Co-N.	33x45	B&B.	Bak.	LM-7150	DR.	36x3 ^{1/2}	36x5		Garford....2 ^{1/2}	2375	Bu-WU.	33x4 ^{1/2}	Own.	Own.	Ti-6460.	WO.	36x3 ^{1/2}	36x5
Bessemer.....J2 ^{2 1/2-3}	2895	Co-C2.	43x5 ^{1/2}	B&B.	B-L.	LM-7250	DR.	36x4	36x4d		Garford....70H ^{2 1/2}	3250	Bu-HTU	41x2 ^{1/2}	Own.	Own.	Ti-6560.	WO.	36x4	36x8
Bessemer.....K2 ^{3 1/2-4}	3495	Co-E7.	43x5 ^{1/2}	B&B.	B-L.	To-E.	IG.	36x5	36x10		Garford....80	4200	Bu-YTU	41x2 ^{1/2}	Own.	Own.	Ti-6666.	WO.	36x5	36x5d
Bethlehem.....KN ¹	1385	Own.	31x5	B&B.	Det.	Ele-1000.	SB.	35x5n	35x5n		Garford....65D ⁵	5000	Bu-BTU	5x6 ^{1/2}	Own.	Own.	Ti-6700.	WO.	36x6	40x6d
Bethlehem.....GN ²	2185	Own.	43x5 ^{1/2}	B&B.	Det.	Wi-900.	DR.	34x4	34x6		Garford....150A ^{7 1/2}	5750	Bu-BTU	5x6 ^{1/2}	Own.	Own.	Ti-6700.	WO.	36x5	40x14
Bethlehem.....HN ³	2985	Own.	43x5 ^{1/2}	Ful.	Det.	Wi-88E.	DR.	36x4	36x8		Garford....151	175	Bu-WU.	33x4 ^{1/2}	Own.	Own.	Ti-6700.	WO.	36x5	36x5
Brockway.....S ¹	Wi-SU.	4x5	B-L.	B-L.	Ti-5200I.	SB.	33x5n	33x5n		Gary....F ¹	1245	Ly.	33x4 ^{1/2}	B&B.	B-L.	Ti-6460.	WO.	36x3 ^{1/2}	36x7	
Brockway.....S ¹	Wi-SU.	4x5	B-L.	B-L.	Ti-6160.	WO.	36x4	36x6		Gary....J ^{2 1/2}	2450	Bu-GTU	43x5 ^{1/2}	Own.	Own.	Ti-6560.	WO.	36x4	36x8	
Brockway.....K ²	Co-K4.	43x5 ^{1/2}	B-L.	B-L.	Ti-6560.	WO.	36x5	36x8d		Gary....JO ^{2 1/2}	2850	Bu-HTU	43x5 ^{1/2}	Own.	Own.	Ti-6660.	WO.	36x5	40x10	
Brockway.....T ⁵	Co-L4.	43x5 ^{1/2}	B-L.	B-L.	Ti-6700.	WO.	36x6	40x7d		Gary....K ^{3 1/2}	3790	Bu-YTU	41x2 ^{1/2}	B-L.	B-L.	Ti-6700.	WO.	36x6	40x12	
Buick.....234-SD ^{2 1/2}	945	Own.	33x4 ^{1/2}	Own.	Own.	SB.	31x4n	31x5n		Gary....M ⁵	4450	Bu-BTU	5x6 ^{1/2}	Own.	Own.	Ti-6700.	WO.	36x5	40x12	
Case.....TR ²	Own.	41x5 ^{1/2}	TD.	Own.	To-C139.	IG.	36x8n	38x7n		Graham Bros. ....1	1265	Do.	37x4 ^{1/2}	Dod.	Dod.	Own.	SB.	33x4 ^{1/2}	34x5n	
Chevrolet.....Sup'r ^{1/2}	395	Own.	31x4	Own.	Own.	SB.	30x3 ^{1/2}	30x3 ^{1/2}		Graham Bros. ....1 1/2	1325	Do.	37x4 ^{1/2}	Dod.	Dod.	Own.	SB.	33x4 ^{1/2}	36x6n	
Chevrolet.....Util ^{1/2}	550	Own.	31x4	Own.	Mun.	SB.	31x4n	34x4 ^{1/2}		Grimm-Pion....10	1245	Ly.	33x4 ^{1/2}	B&B.	Sa-1483	SB.	33x5n	33x5n		
Clinton.....20 ^{1-11/2}	1980	Bu-WTU	33x4 ^{1/2}	B-L.	B-L.	Ti-6250.	WO.	34x5	31x5n		Grimm-Pion....15 ^{1 1/2}	1750	Co-N.	34x5	Ful.	Cl-1D.	IG.	36x3 ^{1/2}	36x5d	
Clinton.....45 ^{1 1/2-2}	2310	Bu-GTU	1x5 ^{1/2}	B-L.	B-L.	Ti-6160.	WO.	34x4	31x3 ^{1/2}		Grimm-Pion....65 ^{2 1/2}	2250	Co-J4.	34x5	Ful.	En-603.	WO.	36x3 ^{1/2}	36x5d	
Clinton.....65 ^{2 1/2-3}	3180	Bu-ETU	33x4 ^{1/2}	B-L.	B-L.	Ti-6560.	WO.	34x5	31x5d		Grimm-Pion....20 ²	2475	Co-K4.	34x5	Ful.	Sh-103.	WO.	36x4k	36x8	
Clinton.....90 ^{3 1/2-4}	4160	Bu-YTU	41x5 ^{1/2}	B-L.	B-L.	Ti-6666.	WO.	36x6	36x8d		Grimm-Pion....40 ³	3300	Hi-500.	31x5	Ful.	Sh-21.	WO.	36x5	36x10k	
Clydesdale.....10A ^{1 1/2-2}	1785	Co-N.	39x45	B&B.	B-L.	Ti-6250.	SB.	34x5n	36x5d		Grimm-Pion....50 ³⁻⁶	3550	Co-B2.	41x5 ^{1/2}	Ful.	Hi-200.	WO.	36x6k	40x6kd	
Clydesdale.....8 ^{2 1/2-3}	2500	Co-K4.	43x5 ^{1/2}	B-L.	B-L.	Ti-6666.	WO.	36x6	40x6d		Gray....1	575	Own.	33x4	Own.	Own.	Ti....SB.	30x3 ^{1/2}	32x4 ^{1/2}	
Clydesdale.....8 ^{2 1/2-3}	3300	Co-L4.	43x5 ^{1/2}	B-L.	B-L.	Ti-6560.	WO.	36x5	36x5d		Indiana....10 ¹	1250	Ly.	34x5 ^{1/2}	B&B.	Ti-5511.	SD.	34x5n	34x5n	
Clydesdale.....2 ⁶⁻⁷	4200	Co-B5.	43x6	B-L.	B-L.	Ti-6666.	WO.	36x6	40x7d		Indiana....12 ^{1 1/2-2}	1250	He-O.	34x5 ^{1/2}	B&B.	Ti-5511.	SD.	34x4	36x7	
Commerce.....9 ^{1 1/2-4}	4500	Co-B5.	43x5 ^{1/2}	B-L.	B-L.	Ti-6700.	WO.	36x7	40x7d		Indiana....25 ^{2 1/2-3}	1250	He-O.	34x5 ^{1/2}	B&B.	Ti-5511.	SD.	34x4	36x12	
Commerce.....14 ^{1 1/2-2}	1455	Co-J4.																		

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tens Capacity	Price	ENGINE			GEARSET MAKE	REAR AXLE		TIRES		MAKE AND MODEL	Tens Capacity	ENGINE			GEARSET MAKE	REAR AXLE		TIRES		
			Make & Model	Bore & Stroke	Cylinder		Clutch Make	Final Drive	Front	Rear			Make & Model	Bore & Stroke	Cylinder		Clutch Make	Final Drive	Front	Rear	
Kissel.	4	\$3625	Own.	4 1/4 x 5 1/2	4	War.	War.	Sh-31...	WO...	36x5	36x12	Schacht.	5	\$4600	Wi-VAU	4 1/2 x 6	B&B.	Own....	WO...	36x5	40x7d
Larrabee.	X2-1 1/2	1785	Co-8R.	3 3/4 x 4 1/2	4	B-L.	B-L.	SA-1480	SB...	34x5	34x5n	Selden.	30C 1 1/2	2375	Co-JA.	3 3/4 x 5 1/2	B-L.	W.O.	34x3 1/2	34x5k	
Larrabee.	J4 1 1/2-2 1/2	2400	Co-C4.	3 3/4 x 5	4	B-L.	B-L.	Sh-1501	WO...	34x3 1/2	34x5k	Selden.	50B 2 1/2	3250	Co-K4.	4 1/2 x 5 1/4	B-L.	W.O.	36x4k	36x7k	
Larrabee.	K5 2 1/2-3 1/2	3550	Co-L4.	4 1/2 x 5 1/2	4	B-L.	B-L.	Sh-22...	WO...	36x4	36x8	Selden.	53B 2 1/2	3550	Co-L4.	4 1/2 x 5 1/2	B-L.	W.O.	36x4k	36x7k	
Larrabee.	L4 3 1/2-4 1/2	4100	Co-C4.	4 1/2 x 5 1/2	4	B-L.	B-L.	Sh-31...	WO...	36x5	36x10	Selden.	70B 3 1/2	4175	Co-B4.	4 1/2 x 5 1/2	B-L.	W.O.	36x5k	36x10k	
Maccar.	EX 1 1/2	—	Wi-SU.	4x5	4	B-L.	B-L.	SA-1826e	SB...	34x5	34x6n	Selden.	73 3 1/2	4475	Co-B5.	4 1/2 x 6	Del.	W.O.	36x6k	40x12	
Maccar.	H-1 1/2	—	Wi-TAU	4x6	4	B-L.	B-L.	Ti-6400	WO...	36x4	36x6	Selden.	90A 5	4950	Wi-WB.	4 1/2 x 6	B-L.	W.O.	34x5n	34x5n	
Maccar.	HT 2	—	Wi-TAU	4x6	4	B-L.	B-L.	Ti-6500	WO...	36x4	36x4d	Service.	25 1 1/2	—	Bu-WTU	3 3/4 x 5 1/2	B-L.	W.O.	34x3 1/2	34x6	
Maccar.	M-2 1/2	—	Wi-UAU	4 1/2 x 6	4	B-L.	B-L.	Ti-6760	WO...	36x6	40x6d	Service.	33 1 1/2	—	Bu-GBU	4 1/2 x 6	B-L.	W.O.	36x4	36x7	
Maccar.	G-1 5	—	Wi-RBU	5x6	4	B-L.	B-L.	Ti-6800	WO...	36x6	36x6	Service.	42	—	Bu-EBU	4 1/2 x 6	B&B.	W.O.	36x4	36x8	
MacDonald.	O 3-5	5500b	Bu-WTU	3 3/4 x 5 1/2	4	B-L.	B-L.	**Own.	IG...	36x6	36x10	Service.	61 3	—	Bu-EBU	4 1/2 x 6	B&B.	W.O.	36x5	36x10	
MacDonald.	A 7 1/2	8000b	Bu-YTU	4 1/2 x 6	4	B-L.	B-L.	**Own.	IG...	40x7	40x14	Service.	81 4	—	Bu-YBU	4 1/2 x 6	B&B.	W.O.	34x4	36x6	
Mack.	AB 1 1/2	3000	Own.	4x5	4	Own.	Own.	Ch...	36x4	36x3 1/2	36x5	Signal.	NF 1 1/2	—	Bu-YBU	4 1/2 x 6	B-L.	W.O.	34x4	36x8	
Mack.	AB 1 1/2	3450	Own.	4x5	4	Own.	Own.	DR...	36x4	36x3 1/2	36x5	Signal.	H 2 1/2	—	Co-K4.	4 1/2 x 5 1/4	B-L.	W.O.	34x4	36x8	
Mack.	AB 2	3300	Own.	4 1/2 x 5	4	Own.	Own.	DR...	36x4	36x4d	36x5	Signal.	J 3 1/2	—	Co-K4.	4 1/2 x 5 1/4	B-L.	W.O.	34x4	36x8	
Mack.	AB 2	3750	Own.	4 1/2 x 5	4	Own.	Own.	DR...	36x4	36x4d	36x5	Signal.	M 5	—	Co-L4.	4 1/2 x 5 1/4	B-L.	W.O.	34x4	36x8	
Mack.	AB 2	3400	Own.	4 1/2 x 5	4	Own.	Own.	DR...	36x4	36x4d	36x5	Signal.	R 7 1/2	—	Co-B5.	4 1/2 x 6	B-L.	W.O.	34x4	36x8	
Mack.	AB 2	3850	Own.	4 1/2 x 5	4	Own.	Own.	DR...	36x4	36x4d	36x5	Star.	75 1/4	1330	Co-N...	3 3/4 x 5	B-L.	W.O.	36x5	40x10	
Mack.	AC 3 1/2	4950	Own.	5x6	4	Own.	Own.	Ch...	36x5	40x5d	40x6d	Standard.	75 1/2	1695	Co-N...	3 3/4 x 5	B-L.	W.O.	36x6	40x12	
Mack.	AC 3 1/2	5500	Own.	5x6	4	Own.	Own.	Ch...	36x6	40x6d	40x6d	Standard.	25 2 1/2	2795	Co-K4.	4 1/2 x 5 1/4	B-L.	W.O.	36x4	36x8	
Mack.	AC 6 1/2	5750	Own.	5x6	4	Own.	Own.	Ch...	36x6	40x6d	40x6d	Standard.	35 3 1/2	3645	Co-L4.	4 1/2 x 5 1/4	B-L.	W.O.	36x5	36x12	
Mack.	AC 7 1/2	6000	Own.	5x6	4	Own.	Own.	Ch...	36x7	40x7d	40x7d	Standard.	5K 5	4495	Co-B5.	4 1/2 x 6	B-L.	W.O.	36x6	40x14	
Mack.	AC 7	3400	Own.	4 1/2 x 5	4	Own.	Own.	Ch...	36x4	36x4d	36x5	Star.	5 1/2	405	Co-Spec.	3 3/4 x 4 1/4	Own.	War.	30x3 1/2	30x3 1/2	
Mack.	AC 7	4950	Own.	5x6	4	Own.	Own.	Ch...	36x5	40x5d	40x6d	Sterling.	1 1/2	2240f	Wa-FU.	4 1/2 x 6	B-L.	W.O.	36x3 1/2	36x5k	
Mack.	AC 10	5500	Own.	5x6	4	Own.	Own.	Ch...	36x6	40x6d	40x6d	Sterling.	2	3440f	Wa-FU.	4 1/2 x 6	B-L.	W.O.	36x4	36x6k	
Mack.	AC 13	5750	Own.	5x6	4	Own.	Own.	Ch...	36x6	40x12	40x12	Sterling.	2 1/2	3700	Wa-CU.	4 1/2 x 6	B-L.	W.O.	36x4	36x14d	
Mack.	AC 15	6000	Own.	5x6	4	Own.	Own.	Ch...	36x7	40x7d	40x7d	Sterling.	3 1/2	4750	Wa-DU.	4 1/2 x 6	H-S.	Own.	36x5	40x5d	
Mason.	11 1/2	1295	He.	4x5	4	Hoo.	War.	SB...	34x5n	34x5n	34x5n	Sterling.	EHD 5	6000f	Wa-EU.	5x6 1/2	H-S.	Own.	36x6	40x6d	
Master.	11 1/2	—	Bu-WTU	3 3/4 x 5 1/2	4	Ful.	Ful.	Ti-5511	SB...	33x5n	33x5n	Stewart.	16 1	1098	Ly-CT.	3 3/4 x 5	W.O.	36x3 1/2	36x5k		
Master.	21 1/2	—	Wi-OU.	4 1/2 x 5	4	Ful.	Ful.	Ti-6160	WO...	34x4	31x6	Stewart.	15-X 1 1/2	1495	Co-MU.	3 3/4 x 5 1/2	B-L.	W.O.	36x3 1/2	36x5n	
Master.	41 1/2	—	Bu-ETU	4 1/2 x 5	4	Ful.	Ful.	Ti-6560	WO...	34x4	36x8	Stewart.	9 1/2-2	1870	Co-N...	3 3/4 x 5	B-L.	W.O.	36x4	36x14d	
Master.	51 3 1/2	—	Bu-YTU	4 1/2 x 6	4	B-L.	B-L.	Ti-6666	WO...	36x5	40x10	Stewart.	7K 2 1/2	2590	Bu-HTU	4 1/2 x 5 1/2	B-L.	Sh-21...	34x4	34x8k	
Master.	61 3	—	Bu-YTU	4 1/2 x 6	4	B-L.	B-L.	Ti-6780	WO...	36x5	40x12	Stewart.	10X 3 1/2	3140	Bu-YTU	4 1/2 x 6	H-S.	Own.	36x5	36x12	
Master.	64 3-6	1097	Own.	3 3/4 x 4 1/2	4	Own.	Own.	Ti-6800	WO...	35x5n	35x5n	Stoughton.	AS 4 1/4	185	Co-MI.	3 3/4 x 4 1/2	Del.	Can.	34x4 1/2	34x4 1/2	
Menominee.	B 1	1650	Wi-SU.	4x5	4	B&B.	B&B.	Ti-6200	SB...	35x5n	35x5n	Stoughton.	AS 1 1/2	—	Bu-WBX	3 3/4 x 5 1/2	B-L.	Co-52000	SB...	34x5n	
Menominee.	HT 1 1/2	2000	Wi-CAU.	3 3/4 x 5	4	Ful.	Ful.	Ti-800G	WO...	34x3 1/2	36x5k	Stoughton.	B 1/2	—	Co-B5.	4 1/2 x 5 1/2	B-L.	Co-52000	SB...	34x5n	
Menominee.	H 1 1/2	2475	Wi-EAU.	4x5	4	Ful.	Ful.	Ti-800H	WO...	36x3 1/2	36x5k	Stoughton.	D 2	2490	He-CU3	4 1/2 x 5	B-L.	Sh-1501	WO.	36x3 1/2	36x5
Menominee.	D 5	2875	Wi-TAU.	4x6	4	Ful.	Ful.	Ti-800J	WO...	36x4	36x8	Stoughton.	F 3	150f	Mi-402	4 1/2 x 5 1/2	B-L.	Sh-1501	WO.	36x3 1/2	36x5
Menominee.	J 5	4850	Wi-RAU.	4 1/2 x 6	4	B&B.	B&B.	Ti-6780	WO...	36x8	40x12	Thomart.	20 1 1/2	1795	Hi-400.	4 1/2 x 5	War.	W.O.	34x5n	34x5n	
Moline.	10 1 1/2	1693	Own.	3 3/4 x 5	4	B&B.	B&B.	To-A...	34x5n	34x6n	34x6n	Tiffin.	GW 1 1/2-2	2100	Co-C4..	4 1/2 x 5 1/2	Ful.	Cl-AW.	IG.	35x5n	35x5n
Nash.	2018 1 1/2-2	1595	Own.	3 3/4 x 5	4	B&B.	B&B.	Ti-1200	WO...	34x4	34x7	Tiffin.	25 2 1/2	3600	Co-L4.	4 1/2 x 5 1/2	Ful.	Cl-ID.	IG.	34x5n	34x6k
Nash.	4017 2 1/2-2	2750	Bu-HU.	4 1/2 x 5	4	B-L.	B-L.	Ti-1501	WO...	34x4	34x7	Tiffin.	35 3 1/2	3600	Co-B2..	4 1/2 x 5 1/2	Ful.	Cl-2D.	IG.	34x4	34x8k
Nash.	3018 2 1/2-2	2150	Own.	3 3/4 x 5	4	B&B.	B&B.	Ti-1501	WO...	34x4	34x7	Tiffin.	U 7 1/2	3600	Co-C4..	4 1/2 x 5 1/2	Ful.	Cl-3D.	IG.	34x4	34x8k
Nash.	5018 2 1/2-2	2250	Own.	3 3/4 x 5	4	B&B.	B&B.	Ti-1501	WO...	34x4	34x7	Tiffin.	U 7 1/2	3600	Co-C4..	4 1/2 x 5 1/2	Ful.	Cl-3D.	IG.	34x4	34x8k
Noble.	A-7 1/2	1395	Bu-WTU	3 3/4 x 5	4	Ful.	Ful.	Ti-1501	WO...	34x4	34x7	Titan.	21 1/2	2700	Bu-HTU	4 1/2 x 5 1/2	B&B.	Own.	36x4	40x10	
Noble.	A-2 1 1/2	1890	Bu-WTU	3 3/4 x 5	4	Ful.	Ful.	Ti-1501	WO...	34x5	36x7	Titan.	31 1/2	3600	Bu-YTU	4 1/2 x 5 1/2	B&B.	Own.	36x4	40x10	
Noble.	B 3 1/2	2895	Bu-CTU	3 3/4 x 5	4	Ful.	Ful.	Ti-1501	WO...	34x4	36x8	Titan.	5 1/2	4100	Bu-YTU	4 1/2 x 5 1/2	B&B.	Own.	36x4	40x10	
Noble.	D 5 1/2	3150	Bu-ETU	4 1/2 x 5	4	Ful.	Ful.	Ti-1501	WO...	34x5	36x8	Titan.	5 1/2	4100	Bu-YTU	4 1/2 x 5 1/2	B&B.	Own.	36x4	40x10	
Noble.	E 7 1/2-5	3850	Bu-YTU	4 1/2 x 6	4	Ful.	Ful.	Ti-1501	WO...	34x5	36x10	Traffic.	1 1/2	1895	Co-N...	3 3/4 x 5	Cov.	Co-3000	SB...	34x3 1/2	34x4
Old Reliable.	B 2 1/2-2	4250	Wi-VAU.	4 1/2 x 6	4	Ful.	Ful.	Ti-6500	WO...	34x5	36x12	Traffic.	3 1/2	2145	Co-N...	3 3/4 x 5	Cov.	Co-3000	SB...	34x3 1/2	34x7
Old Reliable.	D 5	5000	Wi-RAU.	4 1/2 x 6	4	Own.	Own.	B-L.	Sh-51...	36x6	40x12	Transport.	15 1 1/2	1985	Co-N...	3 3/4 x 5	Cov.	Co-3000			

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

CANADIAN

MAKE AND MODEL	Tens Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE	TIRES		MAKE AND MODEL	Tens Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE	TIRES		
			Make & Model	Bore & Stroke				Final Drive	Front				Make & Model	Bore & Stroke	Final Drive	Front		Final Drive	Front	Rear
Gottfredson... 20	6-1	\$2275	Bu-WTU	3 1/2 x 5 1/8	B-L.	Ti-6250	WO.	34x5n	34x5n	National...	FA	1	Wa-BUX	3 1/2 x 5 1/8	B-L.	Ti-6352	WO.	35x5n	35x5n	
Gottfredson... 40	1 1/2-2	3290	Bu-GTU	4 1/2 x 5 1/8	B-L.	Ti-6400	WO.	36x6n	38x7n	National...	GA	1 1/2	Wa-BUX	3 1/2 x 5 1/8	B-L.	Ti-6460	WO.	34x4k	34x6k	
Gottfredson... 50	2 1/2-3	3775	Bu-EtU	4 1/2 x 5 1/2	B-L.	Ti-6500	WO.	36x4	36x8	National...	HD	2 1/2-3	Wa-CU	4 1/2 x 5 1/2	H-S.	Ti-6560	WO.	36x5	36x10	
Gottfredson... 80	4	4775	Bu-YTU	4 1/2 x 6	B-L.	Ti-6666	WO.	36x12	36x12	National...	NB	3 1/2-4	Wa-DU	4 1/2 x 6	H-S.	Ti-6666	WO.	36x6	36x12	
Gottfredson... 100	5	5800	Bu-BTU	5 x 6 1/2	B-L.	Ti-6700	WO.	36x6	40x14	National...	OA	5	Wa-EU	5 x 6 1/2	H-S.	Ti-6760	WO.	36x6	40x14	
Mapleleaf... 1 1/2	3000	Hi-300...	3 1/2 x 5 1/4	Ful.	Ful.	Sh-1501	WO.	36x4	36x6n	Veteran...	M	1 1/2	Bu-CTU	3 1/2 x 5 1/4	B&B.	Sh-1501	WO.	34x5n	34x5n	
Mapleleaf... AA2	3600	Hi-400...	4 1/2 x 5 1/2	Ful.	Ful.	Sh-103	WO.	36x4	36x7	Veteran...	P	2	3699	Bu-HTU	4 1/2 x 5 1/2	B&B.	Sh...	WO.	36x4	36x7
Mapleleaf... BB3	4050	Hi-500...	4 1/2 x 5 1/2	Ful.	Ful.	Sh-21...	WO.	36x4	36x4d	Veteran...	R	3	4200	Bu-HTU	4 1/2 x 5 1/2	B&B.	Sh-21	WO.	36x4	36x7
Mapleleaf... CC4	4800	Hi-200...	4 1/2 x 5 1/2	Ful.	Ful.	Sh-31	WO.	36x5	36x5d	Veteran...	S	4	5393	Bu-YTU	4 1/2 x 6	B&B.	Sh-31	WO.	36x5	36x10
Mapleleaf... DD5	5625	Hi-1600...	4 1/2 x 5 1/2	Ful.	Ful.	Sh-51	WO.	36x6	36x6d											

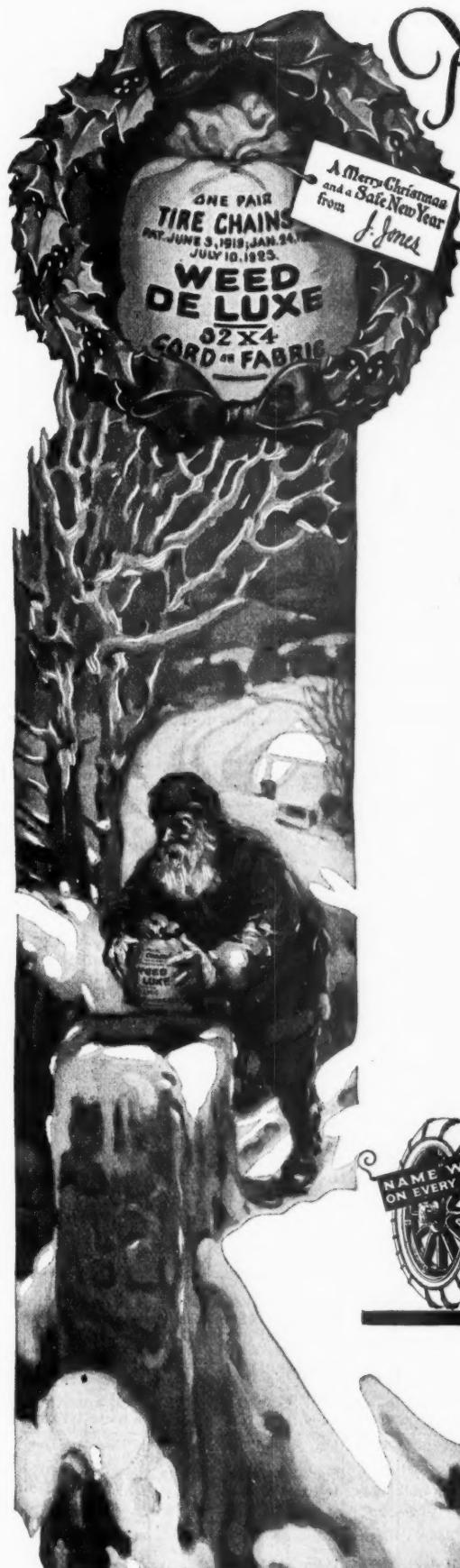
Current Tractor Specifications

MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plows	Price	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (In.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plows	Price	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (In.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plows	Price	ENGINE							
				Make	No. of Cyls. Bare & Stroke			Make	No. of Cyls. Bare & Stroke			Make	No. of Cyls. Bare & Stroke			MAKE & MODEL				Price	Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (In.)					
Allis-Chalmers...	6-12	1	\$325	LeR.	4-3 x 5 1/2	2500	48x 6	Gray...	EU	22-40	4	2385	Wau.	4-5 x 6	6900	t	Rumely OilPull... E	30-60	8-10	Own.	2-10x12	26000	50x30				
Allis-Chalmers...	15-25	3	1285	Mid.	4-4 x 5 1/2	4700	40x12	Hart-Parr...	20	-20	2	...	Own.	2-5 x 6	4250	46x10	Russell...	15-30	3-4	Cli.	4-5 x 6	6000	56x14				
Allis-Chalmers...	20-35	4	1885	Own.	4-4 x 5 1/2	6150	50x12	Hart-Parr...	30	-30	3	...	Own.	2-6 x 7	5220	52x10	Russell...	20-40	4-5	Cli.	4-5 x 7	7900	60x16				
Allwork...	D 20-38	4-5	1695	Own.	4-5 x 7	6500	48x14	Hart-Parr... (Road)	30	-30	3	...	Own.	2-6 x 7	7560	52x18	Shaw-Enoch (Gr.)...	30-60	8-10	Own.	4-8 x 10	2250	84x22				
Allwork...	G 14-28	3	1495	Own.	4-4 x 6	4800	48x12	Hart-Parr...	40	-40	4	...	Own.	4-6 x 6	7510	52x18	Topp-Stewart... B	30-45	4	Wau.	4-4 x 6	7800	42x12				
Allwork...	C 16-30	3	1205	Own.	4-5 x 6	5200	48x12	Heider...	D	16	2	...	Wau.	4-4 x 5	4000	54x 8	Topp-Stewart... B	6-10	2	Wau.	4-3 x 4	2900	41x 9				
Aultman-Taylor...	15-30	3-4	1900	Chi...	4-5 x 6	7800	70x12	Heider...	C	12-20	3	...	Wau.	4-4 x 6	6000	57x10	Townsend...	10-20	2-3	800	Own.	2-6 x 7	4500	48x12			
Aultman-Taylor...	22-45	4-6	3100	Own.	4-5 x 6	12500	70x20	Heider...	M	5-10	...	LeR.	4-3 x 4	2800	46x 6	Townsend...	15-30	3-4	1350	Own.	2-7 x 8	6500	56x18				
Aultman-Taylor...	30-60	8-10	4400	Own.	4-7 x 9	22500	90x24	Huber... (Light)	4	12-25	3	985	Wau.	4-4 x 6	5000	60x10	Townsend...	25-50	4-8	2250	Own.	2-8 x 10	11500	60x24			
Avery...	15	3-4	4400	Own.	4-4 x 6	4750	50x12	Huber... (Super)	5	15-30	3	...	Mid.	4-4 x 6	6000	60x10	Taylor...	6-12	1	500	LeR.	4-3 x 4	1750	38x10			
Avery...	20-35	4-5	10000	Own.	4-4 x 7	7500	60x16	Lauson...	S	12-25	3	...	Mid.	4-4 x 5	4200	...	Twin City...	12-20	3	1200	Own.	4-4 x 6	4700	50x12			
Avery...	25-50	5-6	12500	Own.	4-6 x 7	12500	69x20	Lauson...	T	15-30	4	...	Bea.	4-4 x 6	6200	...	Twin City...	20-35	5	2750	Own.	4-5 x 6	8400	60x20			
Avery...	45-65	8-10	14000	Own.	4-7 x 8	22000	87x24	Leader...	B	18-22	3	375	Own.	2-6 x 6	4800	50x12	Twin City...	40-65	8	4750	Own.	4-7 x 9	23700	84x24			
Avery... Tr. Runner	3	...	4400	Own.	4-4 x 8	5000	x 8	Leader...	B	18-22	3	...	Own.	4-5 x 6	5800	52x12	Uncle Sam... C-20	12-20	2-3	Her.	4-4 x 5	3000	46x12				
Avery... RoadRazer	4	...	4400	Own.	4-4 x 8	4600	42x6	Leader...	N	18-32	3-4	1275	Lincoln	4-4 x 6	3600	50x12	Uncle Sam... B-19	20-30	3-4	Bea.	4-4 x 6	4650	50x12				
Bates (St. Mule) H	15-25	3	...	Mid.	4-4 x 5 1/2	4850	50x12	McCor-k-Deering...	10-20	2	850	McCor-k-Deering...	15-30	3	1250	...	Uncle Sam... D-21	20-30	3-4	Bea.	4-4 x 6	4600	50x12				
Bates (St. Mule) F	18-25	3	...	Mid.	4-4 x 5 1/2	4850	50x10	Little Giant...	B	16-22	4	...	Own.	4-4 x 5	5200	54x14	Wallis...	15-27	3	Own.	4-4 x 5 1/2	3660	48x12				
Bates (St. Mule) G	25-35	4	...	Mid.	4-4 x 6	6500	56x10	Little Giant...	A	26-35	6	...	Own.	5 x 6	8700	66x20	Wisconsin...	16-30	3-4	1750	Chl.	4-5 x 7	7500	52x12			
Bates (St. Mule) M	40-50	4	...	Mid.	4-4 x 6	8500	*84x12	Lombard...	100	12-16	...	...	Own.	6-5 x 7	19000	x 12	Yuba (Ball Tread)...	15-25	4	2750	Wis.	4-4 x 6	5750	*36x12	
Bear...	B	25-35	4	4250	Ste...	4-4 x 6	6000	*61x12	London...	12-25	3	...	Mid.	4-4 x 5	48x12	...	Yuba (Ball Tread)...	25-40	8	4500	Own.	4-5 x 7	10130	*48x17			
Best...	30-36	4	4250	Own.	4-4 x 6	8100	*68x11	McCormick-Deering...	10-20	2	850	McCormick-Deering...	15-30	3	1250	...											
Best...	60-66	9	...	Own.	4-6 x 5	18580	*89x20	Monarch...	E	25-40	4	...	Own.	4-4 x 5	3700	42x12											
Bryan...	Steam	15-30	3	2385	Own.	2-4 x 5	5500	52x12	Monarch...	E	25-40	4	...	Own.	4-4 x 6	5750	50x12										
Case...	12-20	12-20	3	895	Own.	4-4 x 5	4230	42x12	Minneapolis...	B	12-25	3	...	Own.	4-4 x 7	6600	56x12										
Case...	15-27	15-27	3-4	1350	Own.	4-4 x 6	6600	52x14	Minneapolis...	B	17-30	3-4	...	Own.	4-4 x 7	6400	54x12										
Case...	22-40	22-40	4-5	2450	Own.	4-5 x 6	10700	56x16	Minneapolis...	B	22-44	4-5	...	Own.	4-6 x 7	12100	62x20										
Case...	40-72	40-72	8-10	10400	Own.	4-7 x 8	21200	72x20	Minneapolis...	B	35-70	8-10	...	Own.	4-7 x 9	22500	85x30										
Caterpillar... 2 Ton	15	3	...	Own.	4-4 x 5 1/2	4000	...	Moline (Un.)...	D	9-18	2-3	725	McCor-k-Deering...	10-20	2	850	Moline (Ore.)...	9-18	2-3	3340	44x12	...					
Caterpillar... 5 Ton	25	4	...	Own.	4-4 x 6	9400	20000	Monarch...	C	20-30	4	...	Monarch...	D	25-40	4	5000	Bea.	4-4 x 6	8700	66x12						
Caterpillar... 10 Ton	40	6	...	Own.	4-6 x 7	20000	...	Monarch...	D	35-60	4	...	Monarch...	D	35-60	4	6000	Bea.	4-6 x 6	15000	89x12						
Cletrac...	F	9-16	2	845	Own.	4-3 x 4	1930	42x 5	Nichols-Shepard...	20-42	4-6	2600	Own.	2-8 x 10	13500	64x20											
Eagle...	F	12-22	3	...	Own.	2-7 x 8	5850	48x12	Nichols-Shepard...	25-50	6-8	3320	Own.	2-9 x 12	20500	69x28											

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES										NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM		GEARSET MAKE	REAR AXLE				
OPEN MODELS			CLOSED MODELS			WHEEL BASE (IN.)	TIRESIZE (IN.)†	MAKE AND MODEL	NO. OF CYL. BORE AND STROKE	HORSE POWER RATING (N.A.C.)	CARBURETOR MAKE	GENERATOR AND STARTER MAKE	IGNITION MAKE	UNIVERSAL TYPE AND MAKE	TYPE AND MAKE	GEAR RATIO†					
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.															
\$1950c	\$1785	\$1850	\$1885c	\$2250	\$2485	.....	127	33x4½	American.....	D-66	H-S.....11000	6-3½x5	29.40	Strom.	G-D....A-K...	s-p B&B...	m Hart	F Salis	4.50	R1-R2
1195	1445c	1425	1495	1495	d1895p	115	32x4	*1Anderson.....	41	Cont....7 U	6-3½x4½	23.44	Zenith	West....	s-p B&B...	Durston	f Univ.	½F Salis	4.75	R1-T1	
1505	1505	1505	1505	1505	1505	122	32x4	*1Anderson.....	50	Cont....8 R	6-3½x4½	27.34	Zenith	Remy	s-p B&B...	Durston	f Univ.	¾F Salis	1.50	R1-T1	
1535	2800	2800	2800	2800	2800	120	32x4	Apperson.....	6	Falls.....	6-3½x4½	23.44	Strom.	Remy	s-p Rock...	Mech.	m Thie.	½F Col.	5.10	R1-R2	
1095	1325d	1395d	1395d	1395d	1395d	130	33x5	Apperson.....	8-23-S	Own.....	8-3½x5	35.80	Johnson	Bijur	m-d Own.	m Thie.	½F Own	4.25	R1-R2		
1595	1850d	1850d	1850d	1850d	1850d	114	31x4	Auburn.....	6-43	Cont....7 U	6-3½x4½	23.44	Strom.	Remy	s-p B&B...	Warner	m Univ.	½F Col.	4.63	R1-T1	
1395	1495d	1495d	1495d	1495d	1495d	124	32x4½	Auburn.....	6-63	Own.....	6-3½x5	25.35	Strom.	Remy	s-p B&B...	Warner	m Thie.	½F Col.	4.63	R1-T1	
1395	1495	1495	1495	1495	1495	118	32x4	Barley.....	6-50	Cont....7 U	6-3½x4½	23.44	Strom.	Delco	Deleo	s-p B&B...	Fuller	f M&E.	¾F Col.	5.10	R1-R2
935	965	800g	1395c	1495	1495	109	31x4	Buick.....	1924	Own.....	4-3½x4½	18.23	Marvel	Delco	m-d Own.	Own....	m Own.	½F Own	4.66	FL-R2	
1275	1295	1135g	1995c	1695	1695	120	32x4	Buick.....	1924	Own.....	6-3½x4½	27.34	Marvel	Delco	m-d Own.	Own....	m Own.	F Own	4.10	FL-R2	
1385g	1565	1675a	1725d	2235t	2285	128	32x4½	Buick.....	1924	Own.....	6-3½x4½	27.34	Marvel	Delco	m-d Own.	Own....	m Own.	F Own	4.70	FL-R2	
2985	2985	2985	2985	3875	3950	122	33x5	Cadillac.....	V 63	Own.....	8-3½x5½	31.25	Own....	Delco	m-d Own.	Own....	m Spicer	F Tim	Opt.	F1-R2	
1750	1790	2230d	2480c	2675	2675	122	32x4½	Case.....	X	Cont....8 R	6-3½x4½	27.34	Schebler	Delco	Deleo	m-d Own.	Own....	f Snead	½F Col.	4.90	R1-R2
1185	2475	2475	2475	3235	3235	122	33x5	Case.....	Y	Cont....6 T	6-3½x4½	31.54	Rayfield	Delco	m-d Own.	Own....	f Snead	¾F Col.	4.70	R1-R2	
1295	1335d	1335d	1335d	1535	1535	117	32x4	*1Chalmers.....	1923	Own.....	6-3½x4½	25.35	Strom.	A-L....A-L...	m-d Own.	Own....	m Mech.	½F Tim	5.13	R1-R2	
1595	1485	1635	1785c	1785	1785	123	32x4	*1Chalmers.....	1923	Own.....	6-3½x4½	25.35	Strom.	A-L....A-L...	m-d Own.	Own....	F Own	4.45	R1-T1		
490	495	395g	640	795	795	103	30x3½	Chevrolet.....	Superior	Own.....	4-3½x4	21.70	Zenith	Remy	c Own....	Own....	m Own.	½F Own	3.77	R1-R2	
1085	1045	1145d	1245	1385	1645d	112½	31x4	Cleveland.....	42	Own.....	6-3½x4½	22.50	Stroum	Bosch	s-p B&B...	Own....	m Mech.	½F Own	4.90	R1-T1	
2175	2175	2175	2475	2750c	3075	127½	33x5 31x7½	Cole.....	Master	Nort.M311	8-3½x4½	39.20	Johnson	Delco	m-d Nort.	Nort....	m Spicer	F Col.	4.70	FL-R2	
1475	1475	1475	1475	1995	1995	115	32x4	Columbi.....	Big Six	Cont....8 R	6-3½x4½	27.34	Strom.	A-L....A-L...	s-p B&B...	Durston	m Spicer	½F Tim	4.75	R1-R2	
995	995	1195d	1395	1495	1650d	115	31x4	Columbi.....	Light Six	Cont....6 Y	6-3½x4½	23.44	Stroum	A-L....A-L...	s-p B&B...	Durston	m Spicer	½F Tim	5.10	R1-T1	
1395p	1295	1595c	1495	2195p	1895t	116	32x4	Courier.....		Falls. 8000	6-3½x4½	23.44	Stroum	West....	A-K....A-K...	s-p B&B...	Muncie	f Flex.	¾F Col.	5.10	R1-T1
3100	3100	3100	3500c	4500	4500	138	33x4½	Crawford.....	23-6-70	Cont....6 T	6-3½x5½	31.54	Zenith	West....	Bosch	m-d B-J....B-L...	B-L....B-L...	m Spicer	½F Tim	R1-R2
6800	6800	6800	7650	7650	7650	142	33x5	Crawford'd-Dagmar.....	6-70	Cont....6 T	6-3½x5½	31.54	Zenith	West....	Bosch	m-d B-J....B-L...	B-L....B-L...	m Spicer	½F Tim	R1-R2
5000	4650	4700	4650c	6350	6450	132	33x5	Daniels.....	23-38	Own.....	8-3½x5½	30.20	Zenith	Delco	m-d Own.	Own....	m Spicer	F Tim	4.23	R1-R2	
5000	5000	5150	6000c	6600	6600	138	33x5	Daniels.....	23-38	Own.....	8-3½x5½	39.20	Zenith	Delco	m-d Own.	Own....	m Spicer	F Tim	4.23	R1-R2	
1295	1495	1495	1495c	1595	1795c	115	31x4	Davis.....	71	Cont....7 U	6-3½x4½	23.44	Stroum	Deleo	s-p B&B...	Peters	½F Tim	5.10	R1-R2		
850	880	880	730g	1035	1250	116	32x4	Dodge Brothers.....	A-22	Cont. Spec	4-3½x4½	24.03	Tiltonson	A-L....A-L...	m-d Own.	N.E....N.E...	m Own.	½F Own	4.54	R1-R2	
3950	3950	4150c	4985c	5550	5900	136	32x6	Dorris.....	6-80	Own.....	6-4 x5	38.40	Strom.	West....	Bosch	m-d Own.	B-L....B-L...	m Spicer	½F Tim	3.77	R1-R2
1095	1245c	1245c	1535d	1595d	1595d	115	31x4	Dort.....	27	FallaT8000	6-3½x4½	23.44	Carter	Bosch	m-d Det.	Own....	m Ther.	½F Flu.	4.60	R1-R2	
6500	6250	6750	6500c	7800	7800	134	33x5	Duessenberg.....	Straight 8	Own.....	8-2½x5	26.45	Strom.	Delco	s-p Own.	Own....	f Cli....	½F Own	4.45	F2-D1	
890	890	1065d	1365	1465	1465	109	31x4	Durant.....	A-22	Cont. Spec	4-3½x4½	24.03	Tiltonson	A-L....A-L...	s-p Own.	Warner	m Spicer	½F Ad.	4.33	R1-R2	
1485	1095	1275d	1395c	1595	1595	112	32x4	Earl.....	40	Own.....	4-3½x5½	18.91	Sooe	A-L....A-L...	s-p B&B...	Own....	f Own.	½F Own	4.87	R1-T1	
985	1195d	1265t	p1625d	112	31x4	Ecar.....	4-40	Lyc.....	K	4-3½x5	21.03	Strom.	Delco	s-p B&B...	Warner	m Peters	½F Salis	4.50	R1-R2		
1395	1595d	1595d	1595d	1995d	1995d	118	32x4	Ecar.....	6-60	Cont....8 R	6-3½x4½	27.34	Strom.	Delco	s-p B&B...	Warner	m Spicer	½F Salis	4.50	R1-R2	
1895	2145	2145	2345	2345	2345	118	32x4½	Eglin.....	23-F Spec.	Own....	6-3½x4½	23.44	Strom.	Dejon	f Eglin....	Bosch	m-d Own.	Own....	½F Col.	4.33	F2-T1
850	850	975	975	110½	31x3½	Essex.....	Own....	6-2½x4	16.54	Own....	6-2½x4	16.54	Own....	Own....	m Spicer	½F Own	5.40	R1-R2			
1195	1195	1195	1895c	1985	1985	120	32x4½	Flint.....		Cont. Spec	6-3½x5	27.34	Strom.	Dejon	s-p Own.	Warner	m Spicer	½F Ad.	....	R1-R2
265r	295s	230g	525	685	590d	100	30x3½	Ford.....	T	Own....	4-3½x4½	22.50	Stroum	Own....	w-d Own.	Own....	m Own.	½F Own	3.63	T1-R2	
2975	2975	2975	3975	3975	3975	132	32x4½	Fox.....	Air-Cooled	Own....	6-3½x4½	27.34	Zenith	West....	Scintilla	m-d B-L....B-L...	B-L....B-L...	m Spicer	½F Tim	4.00	R1-R2
1950	1950	1950	2750c	2250	2950	115	32x4½	Franklin.....	10-B	Own....	6-3½x4½	25.35	Stroum	West....	Scintilla	m-d War....	Conn....	m Peters	½F Fln.	4.80	R1-T1
995	995	1095d	1155c	1145	1445	112	32x4	Gardner.....	Series 5	Lyc....Spec	4-3½x5	21.76	Zenith	West....	West....	s-p B&B...	West....	m Peters	½F Tim	3.90	R1-T1
510	520	625d	685	835	835	100	30x3½	Gray.....	Own....	4-3½x4½	21.03	Scoo...	West....	West....	s-p Own.	West....	m Mech.	½F Tim	R1-T1
2250	2250	3350	3350	120	32x4½	H.C.S.....	Series 4	Weid....		4-3½x5½	22.50	Strom.	Delco	m-d B-L....B-L...	B-L....B-L...	m Spicer	¾F Own	4.63	R2-R2		
2650	2650	3350	3350	126	32x4½	H.C.S.....	Series 6	Delco		6-3½x5	29.40	Strom.	Delco	m-d B-L....B-L...	B-L....B-L...	m Spicer	¾F Own	4.36	R2-R2		
1395	1395	2195	2195	121	32x4	Hanson.....	66	Cont....8 R	6-3½x4½	27.31	Marvel	Delco	s-p A-B....G-L...	G-L....G-L...	m Univ.	F Tim	4.66	R1-R2			
1345	1345c	1950	1950	115	32x4	Hatfield.....	A-42	H-S....7000	4-3½x5	19.60	Zenith	Dyneto	s-p B&B....G-L...	G-L....G-L...	m Univ.	½F Col.	4.60	R1-R2			
1775	1775	2175c	2350	121	32x4	Hatfield.....	6-55	Stroum	40	6-3½x5	25.35	Strom.	Bosch	m-d Long....	Conn....	m Spicer	½F Col.</td				



For a Merry Christmas and a Safe New Year

GIVE him a set of Weed Chains—the gift which completely expresses the spirit of Christmas—good will to men and peace on earth that comes from SECURITY!

When roads are slippery he will smile in gratitude as he snaps the Weed Chains securely on by pressing the new Lever Locking Connecting Hooks.

He will appreciate your tribute to him as a careful, intelligent driver who puts on Weed Chains whenever they are needed to make motoring safe for himself, his family and all those who use the streets and highways.

The name WEED is stamped on the cross chain hooks and Lever Locking Connecting Hooks of Weed and Weed De Luxe Chains. It stands for Safety and Economy.

AMERICAN CHAIN COMPANY, Inc.
Bridgeport  Connecticut

In Canada: DOMINION CHAIN COMPANY, LIMITED, Niagara Falls, Ontario
District Sales Offices:
Boston • Chicago • New York • Philadelphia • Pittsburgh • San Francisco
The World's Largest Manufacturers of Chains for All Purposes

WEED CHAINS

MR. DEALER: "Weed Chains for Christmas" sentiment took the public by storm last year. Let's work together again this year and bring about another Christmas landslide for Weed Chains. We are doing our part by running this advertisement in

*The Saturday Evening Post, December 8th issue
The Country Gentleman, December 8th issue*

*The Literary Digest, December 8th issue
Successful Farming, December issue*

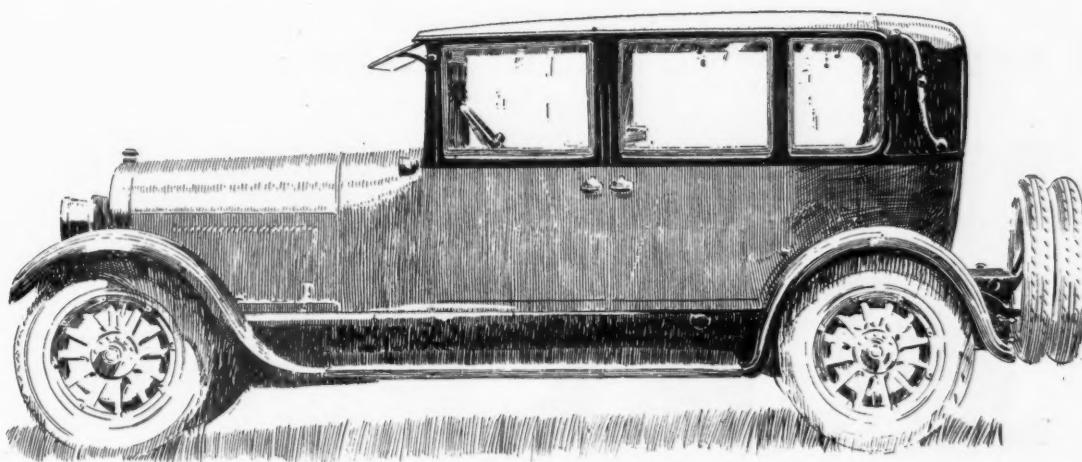
*The Farm Journal, December issue
The Sunset Magazine, December issue*

You can coöperate by asking your jobber for one of our 18-inch lithographs of the Weed Chain Christmas Wreath shown above with reproduction of this advertisement on reverse side. Stick this beautifully designed and colored Wreath on your door not later than December 1st, and be prepared for record-breaking sales of Weed Chains that will start shortly after Thanksgiving Day.

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES								NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM			REAR AXLE				
OPEN MODELS				CLOSED MODELS					Make and Model	No. of Cyl. Bore and Stroke	Horse Power Rating (N.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make	Clutch; Type and Make	Universal; Type and Make	Type and Gear Ratio	BRAKES, Service and Emergency	
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.	Tire Size (Inch) [†]												
5000	5000	5000	4200g	6300	6500	132	33x5	LaFayette.....	Own.....	8-3½x5½	33.80	Johnson.	Deleo.	m-d Own.	F	Own. 4.58	R-L-R		
1795	1795	1795	2145d	(2345)	2345	123	32x4½	Lexington.....	Aust. M	6-3½x4½	26.30	Rayfield.	G-D.	s-p Long.	f Warner.	f Salis. 5.10	R-L-T		
2095	2195	2195		2345	2645														
3800	3800e	3800		4600c	4400	136	33x5	Lincoln.....	Own.....	8-3½x5	36.45	Strom.	Deleo.	m-d Own.	Own.		R-L-R		
8000	7900	7900		11750	11600	142	35x5	*2Locomobile. Series 8	Own.....	6-4½x5½	48.60	Ball&B.	West.	m-d Own.	Own.		R-L-R		
2300g	2785	2785	(2985a)	3585	4285	136	32x4½	*3Marmon.....	Own.....	6-3½x5½	33.75	Strom.	Deleo.	m-d Own.	Own.		R-L-R		
795	795	795	(955)	3985	3985	109	31x4	Maxwell.....	Own.....	4-3½x4½	21.03	Stewart.	Remy.	s-p Mech.	Own.	f Own. 4.60	R-L-T		
2500	2500	2500		3000	3000	127	32x4½	McFarlan.....	Own.....	6-3½x5	27.34	Rayfield.	Deleo.	m-d M&E.	B-L.	m Peters. 3.75	R-L-R		
5400	5600	5700		6720	6600	140	33x5	*4McFarlan.....	Own.....	6-4½x6	48.60	Rayfield.	West.	m-d M&E.	B-L.				
3950b	3950c	3950c		4850	5250	132	32x4½	Mercer..... Series 5	Own.....	4-3½x6½	22.50	Ball&B.	West.	Eisem.	m-d Own.	Own.	m Spicer F Own. 3.87	T-L-R	
3750e	3750e	3750e		4700	5000	132	32x4½	Mercer..... 6	Own.....	6-3½x5	33.75	Strom.	West.	Eisem.	m-d Own.	Own.	m Spicer F Own. 3.77	T-L-R	
1295	1295	1295	1495d	1685c	1695	115	31x4	Moon..... U6-40	Cont. 7 U	6-3½x5½	23.41	Strom.	Deleo.	s-p B&B.	Warner.	m Spicer ½F Tim. 5.10	R-L-T		
				1785	2150	2585	2485	Moon..... 6-53	Cont. 8 R	6-3½x4½	27.31	Strom.	Deleo.	s-p B&B.	B-L.	m Spicer ½F Tim. 5.00	R-L-R		
1240	1240	1050g	1615c	2090c	2040	121	33x4	Nash..... 691-3-6-7	Own.....	6-3½x5	25.35	Marvel.	Deleo.	s-p B&B.	Own.	m Own. ½F Own. 4.50	R-L-T		
1390	1390	1390		1890	2190	127	34x4½	Nash..... 692-4-5-8	Own.....	6-3½x5	25.35	Marvel.	Deleo.	s-p B&B.	Own.	m Own. ½F Own. 4.90	R-L-T		
915	935	935	1195d	1445	1275	112	33x4	Nash..... 41-8	Own.....	4-3½x5	18.23	Marvel.	Deleo.	s-p B&B.	Own.	m Own. ½F Own. 4.88	R-L-T		
2175	2175	2175	2485d	3250	3285	130	32x4½	National..... BB	Own.....	6-3½x5½	29.40	Rayfield.	West.	Deleo.	s-p B&B.	B-L.	m Univ. F Col. 4.08	R-L-R	
2150	2150	2150	2600c	3500	3500	128	33x5	Noma..... 4C	Cont. 8 R	6-3½x4½	27.34	Zenith.	Delco.	s-p B&B.	Detroit.	m Spicer ½F Tim. 4.45	R-L-R		
945	945	1095a	1195	1345	1345	113	31x4	Oakland..... 6-54	Own.....	6-2½x4½	18.90	Strom.	Remy.	s-p Hooa.	Muncie.	m Mech. ½F Own. 4.70	E-L-T		
750	750	885d	955	1035	110	31x4	Oldsmobile..... 30	Own.....	6-2½x4½	18.15	Zenith.	Deleo.	s-p B&B.	Muncie.	f Own. ½F Own. 5.10	R-L-T			
495	495	395g	750	795	695d	100	30x3½	Overland..... 91	Own.....	4-3½x4	19.60	Tillotson	A-L.	s-p B&B.	Own.	m Own. ½F Own. 4.50	R-L-R		
695	695	695		1345	1345	106	30x3½	Overland..... 92	Own.....	4-3½x4	19.60	Tillotson	A-L.	s-p B&B.	Own.	m Own. ½F Own. 4.50	R-L-R		
2185	2485	2250g	2650e	3175c	3275	126	33x4½	Packard..... 126	Own.....	6-3½x5	27.34	Own.	Deleo.	m-d Own.	Own.	m Spicer ½F Own. 4.66	R-L-R		
		2685	2350g	3525c	3575b	133	33x4½	Packard..... 133	Own.....	6-3½x5	27.34	Own.	Deleo.	m-d Own.	Own.	m Spicer ½F Own. 4.66	R-L-R		
3850c	3650			4550c	4725	136	33x4½	Packard "Eight"..... 136	Own.....	8-3½x5	36.45	Own.	Deleo.	m-d Own.	Own.	m Spicer ½F Own. 4.70	R-L-R		
		3850		4900	4900	143	33x5	Packard "Eight"..... 143	Own.....	8-3½x5	36.45	Own.	Deleo.	m-d Own.	Own.	m Spicer ½F Own. 4.70	R-L-R		
2450	2450			12325	13235	131	33x4½	Paige..... 6-70	Cont. 9 A	6-3½x5	33.75	Rayfield.	Remy.	A-K.	m Mecht.	½F Tim. 4.90	R-L-R		
1550	1390	1425	1465d	2395	120	32x4½	Paterson..... 23-6-52	Cont. 8 R	6-3½x4½	27.31	Strom.	Deleo.	s-p B&B.	Durston.	m Hart. ½F Salis.	4.50	R-L-R		
	2690	2750	2260g	3300	3390	128	33x5	Peerless..... 66	Own.....	8-3½x5	33.80	Ball&B.	Deleo.	m-d Own.	Own.	m Spicer ½F Tim. 4.90	R-L-R		
5250	5250	5250		6800	6800	138	33x5	Pierce-Arrow.....	Own.....	6-4 x5½	38.40	Own.	Delco.	m-d Own.	Own.	m Spicer ½F Own. 4.29	R-L-R		
1695	1745	1745	2445	2495	120	32x4½	Pilot..... 6-56	H-S. 90	6-3½x5	25.35	Tillotson	Wagner.	s-p Hooa.	Muncie.	m Blood. ½F Col. 4.67	R-L-R			
2535	2535	2585d	2635d	3385	3585	126	32x4½	Premier..... 6-D	Own.....	6-3½x5½	27.34	Strom.	Deleo.	s-p B&B.	Own.	m Spicer ½F Tim. 4.58	R-L-R		
2300	2300	2350	2400e	3050	3250	124	32x4½	R & V Knight..... H	Own. Kn'gt.	6-3½x4½	29.40	Strom.	A-L.	s-p B-L.	B-L.	m Spicer ½F Tim. 5.40	R-L-R		
1335	1335	1545d	1545d	1875	22325	120	32x4	Reo..... T6	Own.....	6-3½x4	24.34	Rayfield.	N.E.	m-d Own.	Own.	m Own. ½F Own. 4.70	R-L-R		
3200c	3200	3200e		4000	4000	131	32x4½	Revere..... M	(Dues. 4-4½x6	28.90	Strom.	West.	Bosch.	m-d B-L.	B-L.	m Spicer ½F Stnd. 3.44	R-L-R		
1685	1485	1885c	1885	117	32x4	*4Rickenbacker..... B	(Monsen. 4-4½x6	30.63	Strom.	West.	Bosch.	Bosch.	s-p Own.	Warner.	m Mech. ½F Col. 5.10	R-L-T			
2685	2485	2685	2750e	3285	3585	128	32x4½	*4Rickenbacker..... 6-54-E	Cout. 12XD	6-3½x5½	29.40	Strom.	West.	s-p B&B.	G-L.	f Snead. ½F Tim. 4.60			
13685	13685	3485	3800	3650c	4250p	3950	138	32x4½	Roamer..... 6-54-E	Cont. 12XD	6-3½x5½	29.40	Strom.	West.	Split.	m-d B-L.	B-L.	f Snead. ½F Tim. 4.60	R-L-R
13785	975			1175	1275	112	31x5½	Roamer..... 4-75-E	Cont. 12XD	4-4½x6	28.90	Strom.	West.	Split.	m-d B-L.	B-L.	f Snead. ½F Tim. 4.08	R-L-R	
11400	10900	11450		12800	12850	143½	33x5	Rollin..... 40-50	Own.....	4-3½x4½	16.90	Tillotson	Dyneto.	s-p B&B.	Muncie.	f Snead. ½F Salis. 5.10	F-L-F		
				13500	12900	118	32x4	Ruby.....	Own.....	6-4½x4½	48.60	Own.	Bosch.	s-p Own.	Own.	m Own. F Own. 3.72	R-L-R		
				5100	5200	118	32x4	Ruby.....	Own.....	4-2½x4½	12.10	Strom.	Bosch.	s-p Own.	Own.	F Own. 5.10	R-L-R		
1615	1645			2645d	2615	118	33x4	Sayers Six..... DP	Cont. 8 R	6-3½x4½	27.34	Strom.	Deleo.	s-p B&B.	G-L.	m Arvac. ½F Std. 4.75	R-L-R		
875	875			108	108	102	30x3½	Somers..... L-2 & O-2	Own. KB	6-3½x5	19.60	Zenith.	A-L.	s-p B&B.	G-L.	m Univ. F Peru. 4.75	R-L-R		
985	985			112	112	31x4		Somers..... 50c & 51c	Own. KB	4-3½x5	21.03	Zenith.	A-L.	s-p B&B.	G-L.	m Univ. F Peru. 4.50	R-L-R		
2750	2750	2750	2425g	3585	3985	130	32x4½	Stanley..... 740	Own. Spec.	2-4 x5	13.00	None.	Bijur.	None.	None.	None. ½F Own. 1.50	R-L-R		
490	490	640d	640	785	p935d	102	30x3½	Star.....	Cont. Spec.	4-3½x4½	15.63	Tillotson	A-L.	s-p Own.	Warner.	m Spicer ½F Tim. 4.87	R-L-R		
1750c	1750	1448g	c1995p	2350	d2195t	125	31x4½	Stearns-Knight. SKL4	Own. Kn'gt.	4-3½x5½	22.50	Schebler.	West.	m-d Own.	Own.	m Own. ½F Own. 4.50	R-L-R		
2395	2395	2195g	3395	3395	130	34x4½	Stearns-Knight..... 6	Own. Kn'gt.	6-3½x5	27.34	Schebler.	West.	A-K.	m-d Own.	Own.	f Cli. ½F Own. 4.70	R-L-R		
1295	1295			1595d	1995	117	32x4	Stephens..... 10	Own.....	6-3½x4½	25.35	Strom.	Deleo.	s-p B&B.	Mech.	m Mech. ½F Tim. 5.10	R-L-T		
				2250	124	33x4½		Stephens..... 20	Own.....	6-3½x4½	25.35	Strom.	Deleo.	s-p B&B.	Mech.	m Mech. ½F Tim. 5.30	R-L-T		
1985	1985			2800	d2750p	125	32x4½	Sterling-Knight.....	Own. Kn'gt.	6-3½x4½	25.35	Strom.	West.	m-d Fuller.	Fuller.	f Clim. ½F Tim. 4.66	R-L-R		
975	975	848g		1195	1485	1395d	112	31x4	Studebaker. Light Six	Own. Kn'gt.	6-3½x4½	23.44	Strom.	Wag-R.	s-p Own.	Own.	f Ther. ½F Own. 4.55	R-L-R	
1325	1350			1100g	1895	1985	119	32x4	Studebaker. Spec'l Six	Own. Kn'gt.	6-3½x5	29.40	Strom.	Wag-R.	s-p Own.	Own.	m Spicer ½F Own. 4.33	R-L-R	
1450g				1750	1835d	2495	2685	Studebaker. Big Six	Own. Kn'gt.	6-3½x5	36.04	Ball&B.	Wag-R.	s-p Own.	Own.	m Spicer ½F Own. 3.70	R-L-R		
1995	1995			2315d	2550	120	32x4	Stutz..... 690	Weid. 690	6-3½x5	27.34	Strom.	Remy.	s-p B&B.	Warner.	m Mech. ½F Tim. 4.66	R-L-R		
2450	2790	2640		2765a	3490	1													



THE NEW V-63 FIVE-PASSENGER SEDAN

"CADILLAC ALWAYS WELCOMES A GOOD DEALER."

The alert Dealer, with his finger on the public pulse, will realize the overwhelming sentiment in favor of V-63 and endeavor to secure the Cadillac franchise in his community.

CADILLAC



Standard of the World

Announcing an improved line of

FISK

REPAIR STOCKS AND FABRICS

PREPARED and packed by a new process which insures the stock or fabric reaching the Vulcanizer without blooming or air drying.

"Tacky" stocks and fabrics insure satisfactory jobs when used with Fisk Cement that sticks.

The condition of this stock when you use it is the important thing.

See for yourself how this new method improves the stock without increasing the cost making Fisk Repair Materials the easiest and safest to work and also

THE LOWEST COST PER JOB

There's a Fisk Tire of extra value for every car, truck or speed wagon



Don't let your car
Time to Re-tire?
(Buy Fisk)

The Fisk Tire Company, Inc.
Chicopee Falls, Mass.



Don't let your car
Time to Re-tire?
(Buy Fisk)

At Last! the

FULTON

Electric Windshield Drier

PAT. APPL'D. FOR

Price Only
\$3.50

For Winter Driving — Now science, with a windshield drier that completely eclipses anything ever before produced, definitely settles the question of keeping both inside and outside of windshield clear of snow, sleet, frost and fog in winter driving.

The Fulton Electric Windshield Drier is a distinct achievement, embodying features found in no other windshield device. It brings to motorists a comfort and security in snow, sleet, fog and rain, not possible with devices that merely scrape the glass.

The only drier that prevents formation of frost and sleet on windshield.

Never need you take your hand from the wheel to operate the Fulton Drier—No moving parts.

Extremely simple in construction, the Fulton Electric Windshield Drier is an attractively designed metal device connected to car battery, that radiates heat just like an electric toaster. Just sufficient heat to quickly rid the glass of moisture, and keep it clear. Never too much heat, to endanger the glass; never a burden on the battery.

Ask your Dealer—Dealer write Jobber or us.

THE FULTON COMPANY Dept. 15-F Milwaukee, Wis.

“—the best known truck in

LAUNDRIES USE THEM
 PLUMBERS USE THEM
 CATERERS USE THEM
 CIRCUSES USE THEM
 SILK MILLS USE THEM
 PAINTERS USE THEM
 LIBRARIES USE THEM
 SURVEYORS USE THEM
 FARMERS USE THEM
 CEMETERIES USE THEM
 FISHERIES USE THEM
 BILLPOSTERS USE THEM
 EVERYONE USES THEM
 STOCKYARDS USE THEM
 ELEVATORS USE THEM
 CLEANERS USE THEM
 BINDERIES USE THEM
 FLORISTS USE THEM
 FLOUR MILLS USE THEM
 EXCAVATORS USE THEM
 BOTTLERS USE THEM
 BAKERS USE THEM
 QUARRIES USE THEM
 GROCERS USE THEM
 PRINTERS USE THEM
 FOUNDRIES USE THEM
 PAPERS USE THEM
 BUILDERS USE THEM
 HOISTERS USE THEM

REPUBLIC

yellow chassis

trucks

We have been using Republic Trucks in our baggage and transfer work for the past five or six years, and we find them very dependable and economical in our work, as they have to be on the job twenty-four hours, day and night, with different drivers, and in all kinds of weather.

We can speak nothing but praise for Republics, and the efficient service rendered by you.

*Yellow Taxi Company,
Evansville, Indiana*

the world'—IMPROVED

VETERINARIES
USE THEM

STEEL MILLS
USE THEM

COTTON MILLS
USE THEM

WAREHOUSES
USE THEM

WHEREVER trucks are used, the Republic is prominent for the character of its ability, for its dominance in numbers. Worthy of its fame, Republic has more trucks at work today than any other exclusive commercial car maker.

This pronounced national preference prophesies local dealer success. No matter what your market demands the Republic full line means *sales*. This line of five models includes the right truck for every duty. The performance possibilities of every Republic on the dealer's floor are vouched for by thousands of the same type on the job in every field of industry.

—AND NOW IMPROVED

Today's Republic is the finest mechanical job ever turned out in Republic history. The engine develops more power, the brakes and controls contribute greater safety and comfort, than ever before. All Republic endurance and economy records are being eclipsed by current models.

Republic's present management, with an exceptionally sound financial basis, is utilizing Republic's experience toward new attainment. The Republic contract means a good deal more than a discount. Shrewd truck men are investigating. Write or wire.

REPUBLIC MOTOR TRUCK CO., INC.
More Trucks in Use than any other Exclusive Truck Builder
Alma, Michigan

NURSERIES
USE THEM

BUTCHERS
USE THEM

WRECKERS
USE THEM

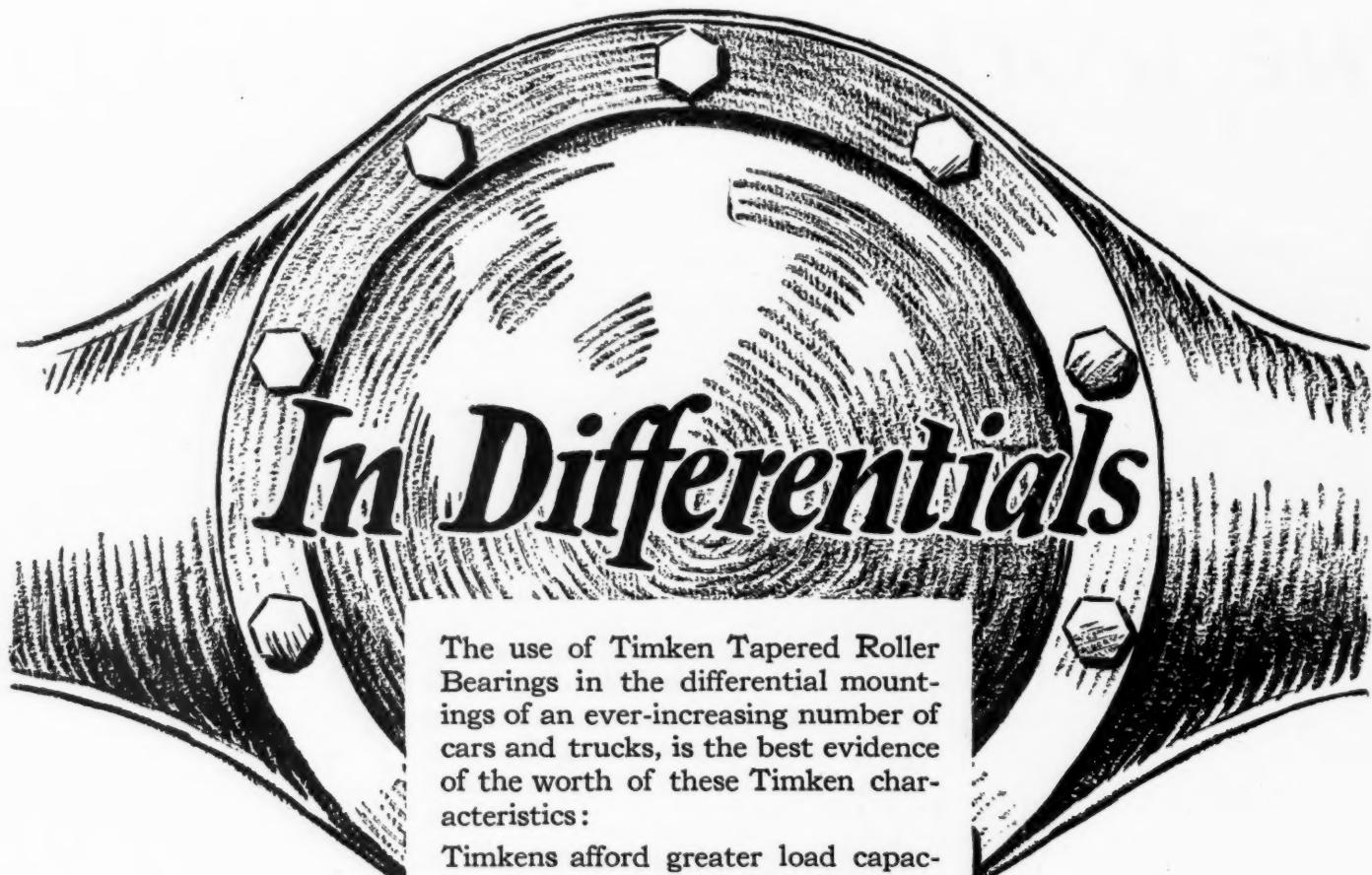
TANNERS
USE THEM

DRILLERS
USE THEM

CHANDLERS
USE THEM

ALL LINES
USE THEM



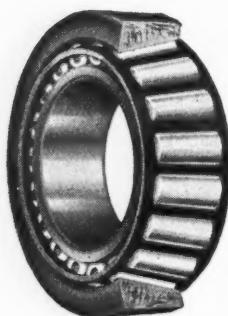


The use of Timken Tapered Roller Bearings in the differential mountings of an ever-increasing number of cars and trucks, is the best evidence of the worth of these Timken characteristics:

Timkens afford greater load capacity than other types of bearings, per unit of space required; which assures the essential degree of rigidity, and permits more compact design.

Timkens carry radial loads, thrust loads, and resultant loads simultaneously, a capacity which handles to the best advantage the driving loads, the thrust of spiral gears, the stress of propeller-shaft brakes (in many cars), and the inevitable shock loads.

Timkens are adjustable for the wear that *must* follow motion, which permits correct gear alignment to be maintained, the greatest assurance of rear axle silence throughout the life of the car or truck with a Timken-equipped differential.



The Timken Roller Bearing Co
CANTON, OHIO

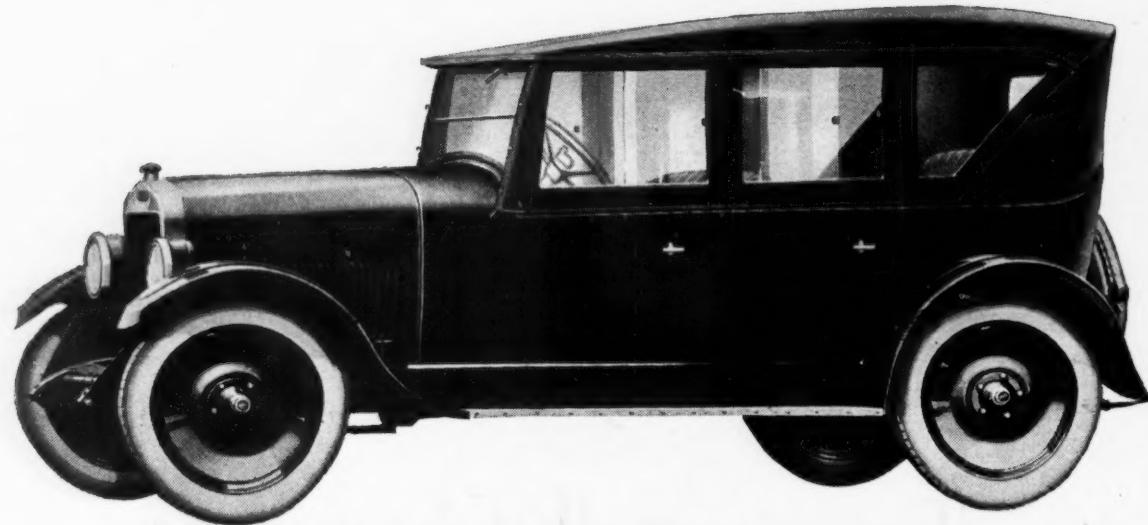
TIMKEN
Tapered
ROLLER BEARINGS

*From
19th
to
7th*

An analysis of
country-wide sales
—all manufacturers
considered—shows that
Oakland advanced
in sales from 19th place
in October 1922 to
7th place in October
1923—

If you want all of the reasons
why - use the coupon on the back.





Oakland Touring Car equipped with Oakland's New Glass Enclosure

THINK what a powerful selling aid it is when Oakland dealers can sell a really fine Six for \$945 and then make a closed car out of it for only \$60 more. Oakland's sturdy permanent top, weather-tight windshield and specially designed body make possible this tight-fitting, fine looking enclosed job. Enclosures are available for all 1924 Oakland open cars—actually making seven closed models in the line.

In countless other ways Oakland has stepped out and forward this year. The new and thoroughly modern L-head engine, the safe and simple four-wheel brakes, the convenient centralized controls on the steering wheel, the full automatic spark control, the disc wheels and the seven new and distinctive Fisher bodies—these are some of the more important features.

This year—as never before—you should be sure that you are selling the right line of cars. Competition is keen, car buyers are critical—you must now be prepared to successfully

Touring Car . . .	\$ 945
Roadster . . .	945
Sport Touring . . .	1095
Sedan	\$1395

The Touring Car

\$945

Glass Enclosure for Touring and Sport Touring . . . \$60
Glass Enclosure for Roadster and Sport Roadster . . . 40

All prices f. o. b. Pontiac

meet the one and satisfy the other. Oakland has recently added hundreds of new dealers. They have chosen the True Blue line because they like the car, the policies of its builders, the liberal selling agreement and the permanent sales possibilities offered.

You, too, should know more about the Oakland car and the interesting plans and policies for the future. Use the convenient coupon below—mail it—get all the facts.

Sport Roadster . . .	\$1095
Business Coupe . . .	1195
Coupe for Four . . .	1345

OAKLAND MOTOR CAR COMPANY - PONTIAC, MICHIGAN
Division of General Motors Corporation

Oakland Motor Car Company
Pontiac, Michigan

Please send me the inside facts about the True Blue Oakland and the True Blue Oakland franchise without any obligation on my part.

Name

Address

Mail This Coupon Today

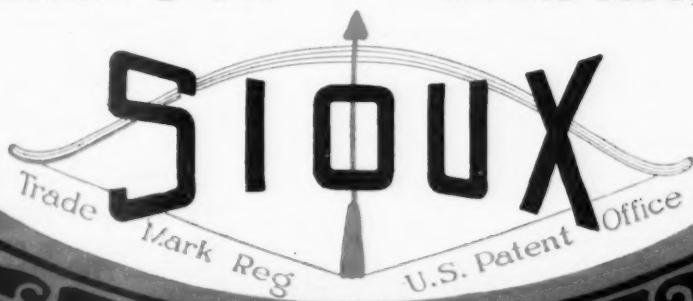


Sioux Valve Grinder

Time is money and time lost is avoidable waste.
You can cut your avoidable waste by the use of this fast
and efficient Sioux Valve Grinder. Grinds correctly and
quickly. Has that reciprocating, or back and forth motion
on the valve, so necessary to perfect valve grinding.

Jobbers Everywhere Sell Them

Write for Catalogue and Valve Seat Reamer Specifications
ALBERTSON & CO. SIOUX CITY, IOWA



Arrow Head DEPENDABLE Products



PISTONS
PISTON PINS
AXLE and DRIVE SHAFTS

GIVEN the finest of raw material and ample resources—
it has been our consistent aim to turn out as good a product as skilled hands, accurate machinery and rigid inspection could produce.

That we have succeeded is best evidenced by the reorders of old users.

You and your customers can rely on
ARROW HEAD DEPENDABLE PRODUCTS

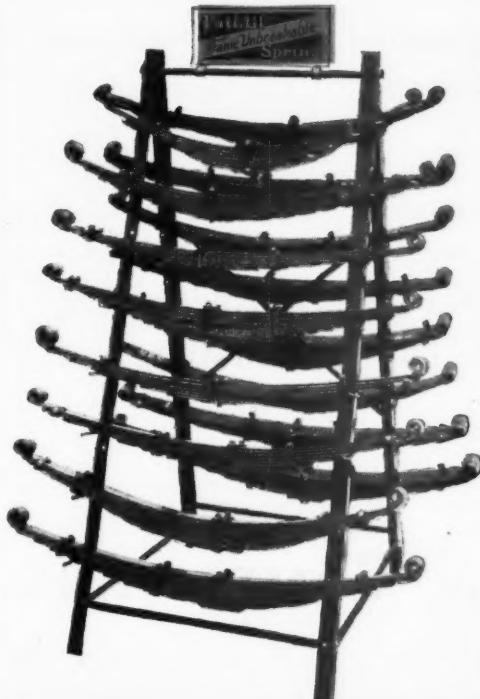
ARROW HEAD STEEL PRODUCTS COMPANY
MINNEAPOLIS

MINNESOTA

TITANIC HUMP CENTER SPRING

**GUARANTEED NOT TO BREAK OR SAG
NO CENTER BOLT - ALLOY STEEL**

**JORDAN & JOSSELYN CO.
15 TEMPLE STREET
PORTLAND - MAINE**



TITANIC SPRING Service Stations make big money!

Free road signs showing *your* name and address, a substantial display rack, "service station" signs, and other sales helps will place *you* in a position to make real profit just as thousands of dealers are doing.

Millions of springs have to be replaced every year. Every replacement means profit if you use TITANICS. Get after this business. We'll help you.

Clip the coupon.

TUTHILL SPRING Co.
760 Polk Street
CHICAGO, ILL.

Gentlemen:
Please tell me how to get all
the silent salesmen you supply.
I want to sell TITANICS.

Name _____

Street Address _____

City and State _____



SQUARE SENTRY
This is the Square Sentry—square to the eye and square to the pocketbook!



McCurnin's Service Station
Des Moines, Iowa
(Sawyer & Watrous, Architects)

Six Square Sentry Pumps

The McCurnin Service Station at Des Moines, Iowa, is 100% Bowser, with its **six** Square Sentry pumps, its **eight** "63" lubricating outfits and its **three** Bowser underground tanks.

The photograph gives a general idea of this unusual and attractive station, with its double driveways. The station houses a coffee shop, a soda fountain, rest rooms, etc., and naturally does its enormous gasoline and oil business easily and quickly because of Bowser equipment.

Full details of this unusual installation may be had for the asking—write for folder A14 and we will send, without charge, our new filling station booklets and "How to Sell More Gas and Oil."

S.F. BOWSER & COMPANY, Inc.
Pump and Tank Headquarters
F O R T W A Y N E , I N D I A N A .
Sales and Service Offices and Representatives Everywhere

yes!

yes!

yes!

yes!

yes!

yes!

yes!

yes!

This is what You Want—

You want a fair, safe, simple contract on a good car that will make you money.

You want a contract on a single page in plain English.

You want a bigger discount.

You want to be your own judge of how many cars you buy—to be unhampered by forced quotas.

You want an established car that out-performs anything in the \$1,000 class.

You want to tie up with a big, live, experienced company—financially sound.

You can have what you want!

Write or wire Box 6095, Motor Age,
5 So. Wabash Ave., Chicago.



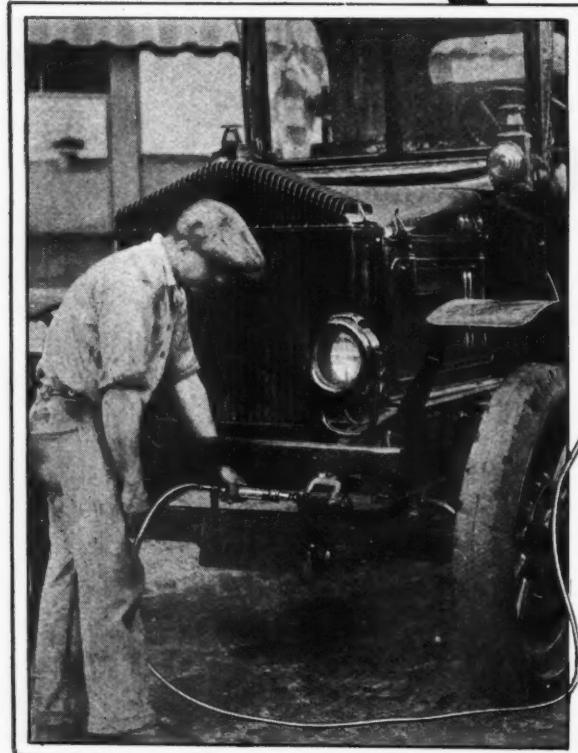
Jobbers' salesmen covering the entire territory are well received by dealers who see quickly the advantages of the DOT exclusive features. Automobile and accessory dealers, hardware and implement dealers, garages and repair shops, are establishing DOT Service, sales and display, thus attracting new customers and building up bigger business.

**ADOPTED
As
Standard Equipment
By
69 Manufacturers
of
Cars, Trucks and
Tractors**

Motor-Driven Portable Tank

(25 lbs. Capacity)

A convenient and time-saving lubricator for automobile and truck manufacturers, fleet owners and service stations.



Why “DOT SERVICE”

Manufacturers who endeavor to build longer and more dependable service into their cars, trucks and tractors, will be interested in the DOT and the service it offers. The DOT System gives thorough **positive** lubrication to the chassis as efficiently as the lubricating system used for the motor. In a few years it has won national recognition and national distribution, solely upon its merits.

Leading engineers who have tested it are enthusiastic and 69 manufacturers of cars, trucks and tractors have already adopted it as a standard equipment. It has been tested and adopted by the U. S. War Department and is used as lubricating equipment for industrial machinery in more than 100 leading American industries.

CARR FASTENER CO.

31 Ames Street
Cambridge, Mass.

Dealers: Get the "Handy Service Kit" and give service to the many DOT owners in your town. It brings new business. Let us send you the name of our jobber, or if you prefer send us the name of the jobber you deal with.



Exclusive DOT Features

1—**PROGRESSIVE** pressure from 1 to 3,000 pounds. Forces out spent grease and forces in fresh lubricant.

2—Direct connection—no tubes. Can be operated entirely with one hand.

3—Automatic valve retains lubricant without turning back handle to relieve pressure. Cannot leak. Handles oil as well as grease or kerosene for flushing bearing.

4—Sturdy steel nipples bring all parts within easy reach. Bronze nipples for marine use.

5—Lubricates entire chassis in 13 minutes or less (Ford in six minutes).

The DOT Lubricator is thoroughly protected by allowed claims of pending patent applications.



DOTS THE MAP

The above map shows the distributing centers of the DOT. Leading jobbers and distributors—strategically located in the largest cities in America—cover every trading area, securing DOT Sales and Service through their thousands of dealers everywhere.

Manufacturers who have standardized on the DOT System, motorists and fleet owners who have installed it, are therefore, assured of efficient service and easily available supplies.

Special DOT representatives are always within easy reach to help you solve your lubricating problems either in the automotive or industrial field. An interview may save you costly losses in depreciation, repairs and production delays, which may be due entirely to faulty methods of lubrication.

MAKERS OF THE "DOT" LINE OF FASTENERS

Used by more than 90% of the automobile manufacturers in America and the majority of the manufacturers abroad.

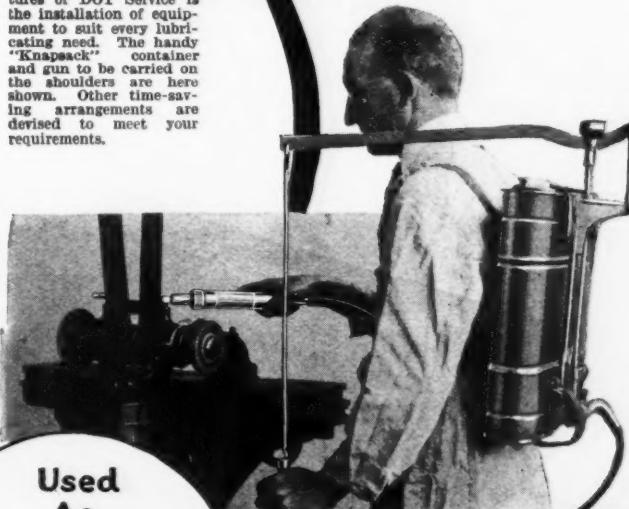
Branch Offices:

40 Selden Ave. 47 W. 34th St. Monadnock Bldg. Gage Av. & Beach Rd.
Detroit New York City San Francisco Hamilton, Ont., Can.

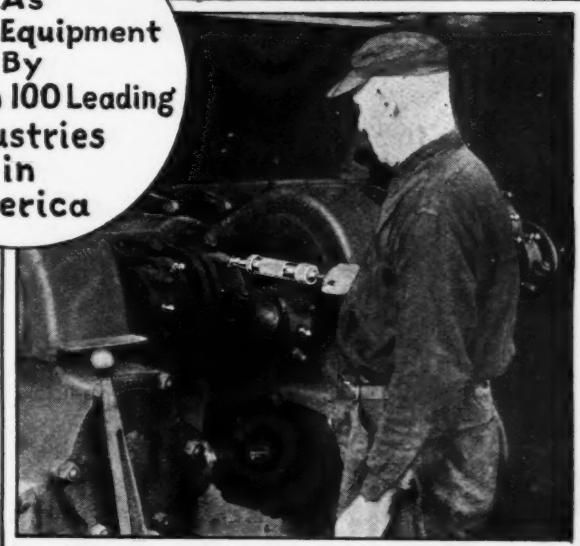
The **DOT.**
high pressure
LUBRICATOR



One of the special features of DOT Service is the installation of equipment to suit every lubricating need. The handy "Knapack" container and gun to be carried on the shoulders are here shown. Other time-saving arrangements are devised to meet your requirements.



**Used
As
Standard Equipment
By
More than 100 Leading
Industries
in
America**



EVERY car owner knows AC's reputation as a spark plug maker because AC advertising year after year has told him that the finest motor cars are factory equipped with AC's.

He knows they have been proven the best spark plug in open competition on racing cars, speed boats and planes.

The dealer who sells AC spark plugs is putting his effort in an article of demonstrated quality and popularity. Likewise he is assured of a good margin of profit.

In view of all this and the immense possibilities cited on the opposite page, are not AC's the spark plugs on which you should concentrate?



*The AC Spark Plug Kit
to carry spare plugs*

*The opposite page proves
why AC is the leader in
the spark plug field.*

Make Four Sales Instead of One

When the motorist asks for a plug place the **AC Plug Kit** before him, containing four plugs. Show him how convenient it is when the motor misses or performs poorly to take the **AC Plug Kit** and change the plugs. Then at his convenience he can clean and test the removed plugs and put them back into the **AC Plug Kit** for future use. You can offer them these **AC Plug Kits** free with a set of AC's—the kits cost you nothing; ask your Jobber's salesman.

Sell A C Spark



Think of all the CHEVROLETS—they have always been AC-equipped.

- all the BUICKS—AC-equipped for fifteen years.*
- all the DODGE BROTHERS—have never used anything but AC.*
- all the NASH cars—always AC-equipped.*
- OAKLANDS—for the past fifteen years AC-equipped.*
- all the DURANTS—have never used anything but AC.*
- all the STARS—always AC-equipped.*
- all the HUDSONS—AC-equipped for the past ten years.*
- all the ESSEX cars—have never used anything but AC.*
- all the MAXWELLS—AC-equipped for years.*
- all the CHALMERS—AC-equipped for years.*
- all the PAIGE cars—for the past eight years AC-equipped.*
- all the JEWETTS—always AC-equipped.*
- OLDSMOBILE—AC-equipped for the past fifteen years.*
- HUPMOBILE—for the past ten years AC-equipped.*
- CADILLAC—AC-equipped for the past ten years.*
- all the CHANDLERS—AC-equipped for the past nine years.*

AND MORE THAN TWO HUNDRED OTHERS—all AC-equipped and already in use in your locality. This tremendous ready-made market for AC's is right at your door and will always be there in ever increasing size. Each day the demand for AC's grows bigger.

Read on the following page about AC

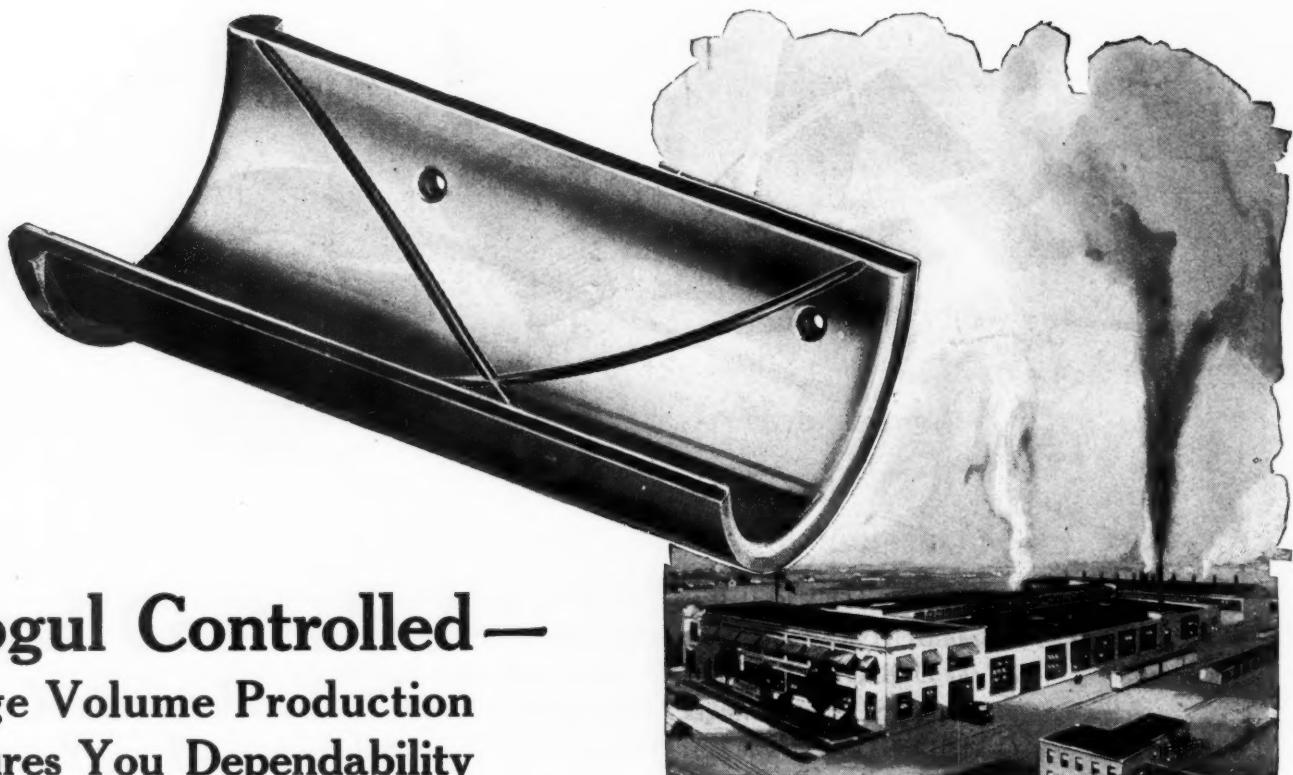
1075 Special for Fords, which gives you an opportunity to take first place in the enormous Ford plug replacement business.

There's an AC plug for every motor—you need not tie up money in other brands but concentrate on AC's, the easiest selling, most profitable and best known quality plug.

AC Spark Plug Company, Flint, Michigan

Makers of AC Spark Plugs—AC Speedometers
U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

Plugs by the Kit



Mogul Controlled— Large Volume Production Assures You Dependability

MOGUL controlled production means that alloys proven right through twenty-five years of service tests are properly blended in our own plant. Under most rigid supervision alloys are held precisely to formula. This careful production of our own bearing metals in our own plant assures you the long life and full transmission of power that you demand from a bearing.

Mogul large volume production is the

This fine plant is devoted exclusively to the production of Mogul bearings, bushings and bearing alloys. In it is included every facility for economical, accurate, large scale production of bearings and bearing metals.

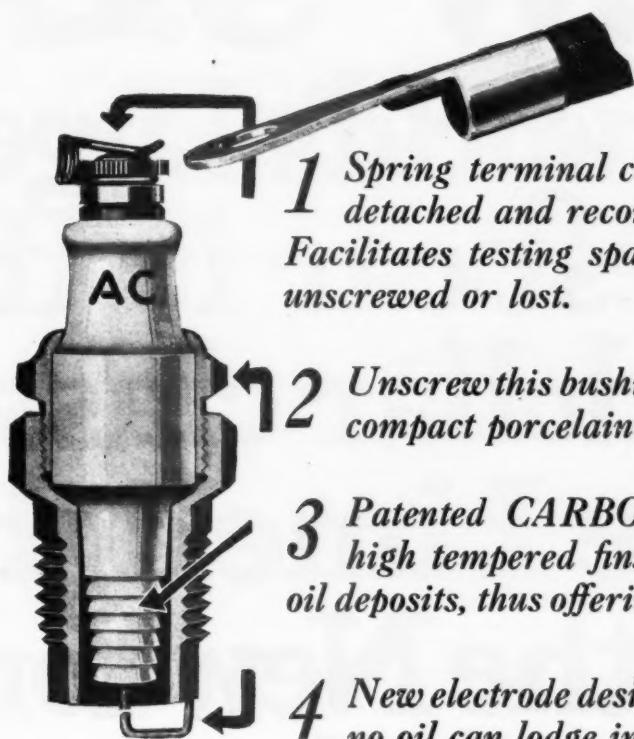
Mogul products include Die Cast Babbitt Bearings and Bushings, Bronze Back Babbitt Lined Bearings, Babbitt Cored Bars, Babbitt Metal.

direct result of a good product coupled with an appreciation of the necessity for consistent, prompt deliveries. It also assures you of a continuation of the policy of delivering on time as promised.

MUZZY-LYON COMPANY
DETROIT MICHIGAN

mogul
Engine Bearings and Bearing Alloys

There are good reasons why this plug sells for a trifle more than ordinary plugs—and here they are:



- 1 Spring terminal clip permits wire to be instantly detached and reconnected while motor is running. Facilitates testing spark plug and coil. No nut to be unscrewed or lost.
- 2 Unscrew this bushing and plug comes apart. Notice compact porcelain to withstand hard service.
- 3 Patented CARBON PROOF porcelain with its high tempered fins attains sufficient heat to burn oil deposits, thus offering effective resistance to carbon.
- 4 New electrode design forms a natural drain so that no oil can lodge in spark gap.

Ford owners everywhere know AC's reputation as a spark plug maker. They know that AC's have been proved best in open competition between racing cars, speed boats and airplanes.

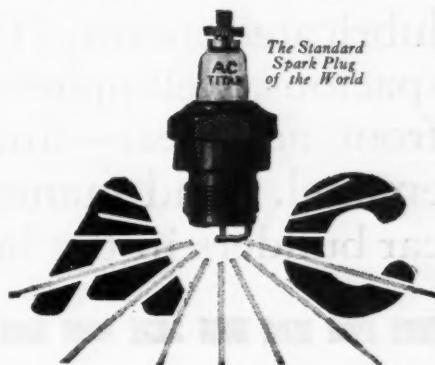
National advertising is showing Ford owners the many features of the AC 1075, which make it a better plug for Ford engines.

Ford owners are easily sold AC1075's when shown their special features—and you make a larger profit on them than on plugs ordinarily sold for Ford engines.



The AC
Plug Kit—to
carry spare plugs

The AC Plug Kit is something the motorist has always wanted to carry his spare plugs. It helps you make four sales instead of one. It is just one more thing that makes AC's easier to sell and consequently gives you a better profit.



AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs—AC Speedometers

U.S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

A new six The world's largest and roomiest car in the thousand dollar class— will be the Limelight Feature of the New York Show. *Do not fail to see it.*

Are you among the thousands of four-cylinder-car dealers who are recognizing the absolute necessity of adding a six to your line?

Are you one of the vast number of six-cylinder-car dealers whose sales volume is showing the dire need of a lower-priced line to reach a larger field of buyers?

Here is a new 50-horsepower six with a vibrationless, pressure lubricated motor, 118-inch wheelbase, long and low, with a big, spacious, well-upholstered body, with ample knee and leg room, front and rear—finished in durable all-weather-proof baked enamel. And manufactured by one of the oldest and strongest car builders in the business.

This car is one of the best selling propositions ever offered. Send in the coupon today

Motor Age, Box 6094
5 South Wabash Avenue
Chicago, Illinois

Send me today, without obligation, full advance details of the new World's Biggest Six in the Thousand Dollar Class.

Name.....

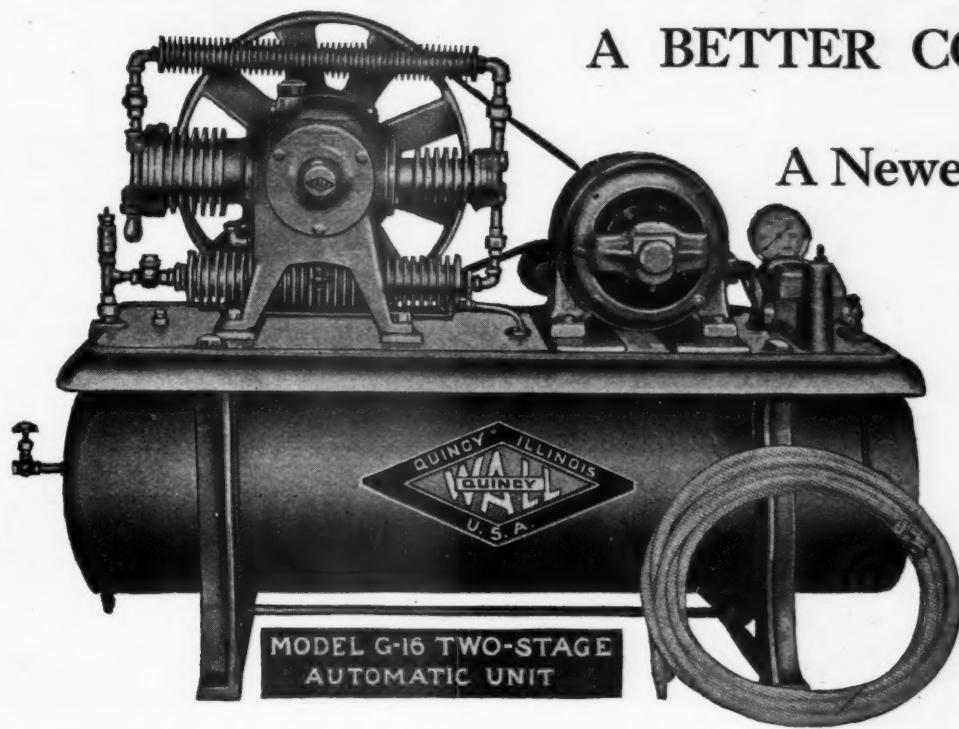
Town.....

State.....

Memorandum

THE QUINCY SILENT AIR-MASTER

A BETTER COMPRESSOR



A Newer Compressor

More
Economical
Silent
Efficient
Dependable

12 FACTS

- 1 Aluminum intercooler delivers cool air to high pressure cylinder.
- 2 Special finned aftercooler delivers cool air to tank.
- 3 Fan blade fly wheel, throwing unrestricted rush of air across each finned cylinder, intercooler and aftercooler. Assures cool dry air.
- 4 Connecting rod assembly, laminated shims for adjustments. This feature is found only in THE QUINCY.
- 5 THE QUINCY excels all others in easy access to its working parts.
- 6 THE QUINCY'S tight, solid construction guarantees freedom from vibration.
- 7 Cylinders are bolted to crankcase, not integral, six cooling fins to each. Pistons are ground to size, rings turned.
- 8 The splash system assures proper lubrication, automatically lubricates all parts. No reciprocating parts touch oil.
- 9 The superior valve construction has many exclusive QUINCY features:
 - (a) Light weight saw blade steel discs, each weighing fraction of an ounce.
 - (b) Spring actuated.
 - (c) Minimum lift, $1/32$ inch. Ground to seat.
- 10 The light weight, minimum lift, large bearing surface means long life. Indestructible.
- 11 Unrestricted air passages.
- 12 Large air volume at low cost. The fastest pumping compressors on the market.

Write Us Your Requirements. We Will Quote Prices and Delivery Dates by Return Mail. Immediate Delivery.

Wall Pump & Compressor Co.

217 Maine Street

Quincy, Illinois, U. S. A.

"BROKE"



ALL OVER! Down and out! Another honest, hard-working owner FLAT BROKE! Another busy garage and service station closed by the Sheriff, just when it seemed to be going good. In fact the owner thought he was doing fine—till—the Crash came.

***That was just the trouble—he
thought he was making good
— he didn't know the facts.***

There was plenty of service work—but not with profit. Good Parts stock—but no proper turnover—too many obsolete parts. Plenty of New Car Sales—but no market for the used cars at the price he traded them in. Accessories were marked up 25%, but it was costing him 32% to do business.

Thousands of other Garages and repair shop owners are in the same boat today: Perhaps you are one of them—guessing your way to bankruptcy, drifting swiftly toward the rocks of failure without knowing it.

You don't have to take these chances. It isn't necessary. Know the exact conditions of your business every day. Have everything at your finger tips. Stop every leak as it occurs. **DON'T GO BROKE.**

COMFORT Printing Specialty Co.

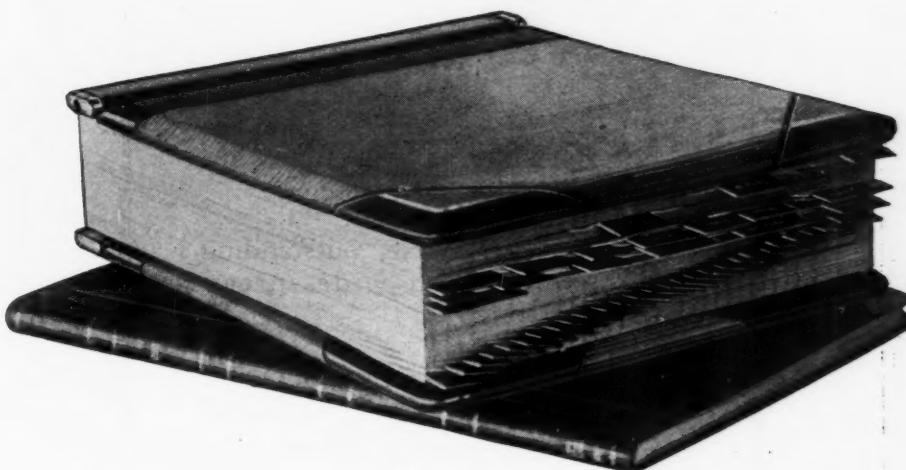
Comfort's Office Record

for Dealers, Garages or Repair Stations

The
Complete System

\$25⁰⁰

Delivered
Your City



Sent on Ten-Day Trial

SEE this book before starting the new year! Just mail us your check for \$25 and we'll send you the complete system. Keep it 10 days. Study it carefully. See how exactly it fits your needs. Then, if you feel you can afford to do without it, ship it back to us.

We will immediately return your \$25 and the whole transaction won't cost you a cent, as we pay all shipping charges, both ways. Don't delay — January is almost here! Use the coupon at bottom of this page.

St. Louis, Mo.

A COMPLETE record in one volume. So simple that a child can understand it, yet so thorough that it takes care of every department of your business. A daily picture of sales, stocks, purchases, overhead, payroll, accounts receivable and payable, your bank account, etc.—**Everything** at a glance! Even your annual income tax report is quickly prepared from it! It is made solely for DEALERS, GARAGES AND REPAIR SHOPS.

COMFORT PRINTING SPECIALTY CO. 101 No. Eighth St., St. Louis. Do you also wish our free booklet, "Making and Saving Profits?" (Yes) (No)

Please send us on ten-day approval Comfort's Office Record for which we enclose our check for \$25.

It is understood that we shall return same within 10 days from its receipt if not satisfactory, and our money refunded. COMFORT is to pay all transportation charges.

Name

Address

City State.....

ATWATER KENT

Radio Equipment is Rapidly Increasing
Business for Automotive Dealers

ATWATER KENT Radio Receiving Instruments have won the enthusiastic endorsement of jobber, dealer and consumer throughout the entire country.

There are, of course, outstanding reasons for such wide-spread interest:—

Truly remarkable performances in radio reception; accuracy of design and built-in durability. These qualities in every ATWATER KENT instrument, together with their reasonable price, will appeal to YOUR customers.



Atwater Kent Loud Speaker

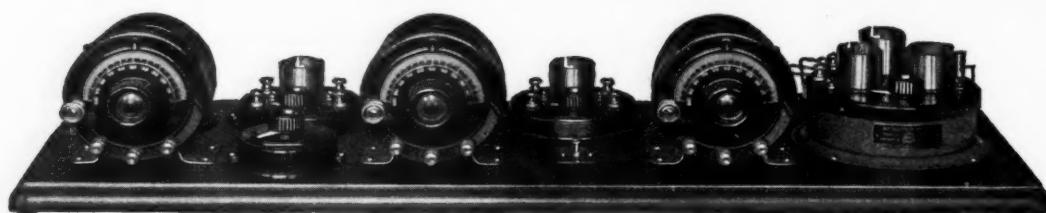


Model 5 Receiving Set



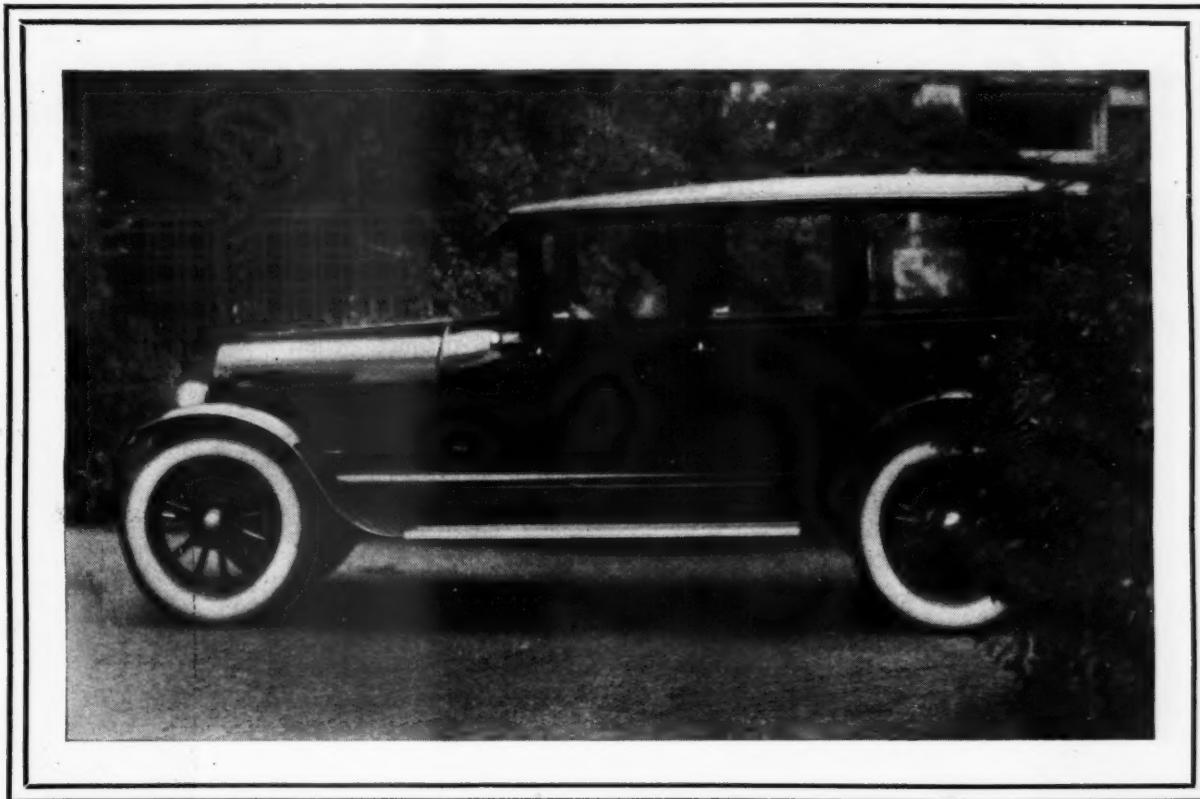
Model 9 Receiving Set

Price list and literature describing Atwater Kent Radio Complete Sets and Parts on request



Atwater Kent Model 10 Receiving Set

ATWATER KENT MANUFACTURING COMPANY, PHILADELPHIA, PA.
4957 STENTON AVENUE



Have You a Tricky "Curb Market" to Worry About?

AVACANT lot covered with tan-bark, a ballyhoo artist with persuading ways and a battery of signs proclaiming "bargain prices"—these are intimate acquaintances of the dealer who sells a line of low resale value. In his struggle to obtain volume, he accepts the trade-in deals that more fortunate dealers have refused to handle. In his scramble to get out from under he sells his used stock on the "curb"—with never a hope of profit.

How long can this dealer last?

Contrasting the position of the Case dealer, we find a man who is making money selling a car which ranks among the very highest in resale valuation. Because of his comparative lack of competition, we see him handling only the more desirable deals. Because of his gen-

erous discount, he is assured of a profit even though he may occasionally be over-optimistic on a long trade. And because the Case Company would rather he make no sale at all than one without profit, he knows that his franchise and territory are not dependent upon his ability to absorb loss.

Frankly, the position of the Case dealer today is an enviable one. If you are less fortunately situated, we'll be glad to show you how Case motor cars—plus a little business sense and a desire to work—will net a handsome profit for you on any investment you care to make. Aside from the high resale value and adequate discount associated with this franchise, there are other reasons why most Case dealers are successful. A word from you will bring the story.

J. I. CASE T. M. COMPANY, RACINE, WISCONSIN



CASE
MOTOR CARS



THE SIGN OF MECHANICAL EXCELLENCE



FOR MORE THAN EIGHTY YEARS

The Tale That The Shadow Tells

—bolt threads produced in
new way have accuracy of .0005"



If you would know the accuracy of bolt threads, let the comparator project their image on the chart, greatly magnified.

Then the truth will come out.

The EMPIRE NEW PROCESS BOLT has a thread accuracy of .0005"—as smooth and clean as a glazed surface.

It possesses almost unbelievable strength—the nut is not made that can strip its threads.

A special addition to the factory has been erected and equipped to produce the NEW PROCESS BOLT.

Samples are available now, for testing and comparing.
Sent upon request.

At left: Ordinary thread.
Below: Comparator photograph.

At right: Empire New Process Thread. Below:
Comparator photograph.



RUSSELL, BURDSALL & WARD
• BOLT & NUT COMPANY •
PORT CHESTER, N.Y.
PEMBERWICK, CONN. CHICAGO SAN FRANCISCO ROCKFALLS, ILL.
MAKERS of Bolts, Nuts and Rivets Since 1845

EMPIRE *New Process* BOLTS



"Resilient as a Lancewood Bow"—Perfection Springs are famous for their splendid riding qualities. Automobile dealers all recognize the figure of the Perfection Archer as symbolizing good spring suspension.

PERFECTION

Intelligent co-operation—both in engineering and production—with car and truck manufacturers, is one of the reasons for the "Perfection" reputation.

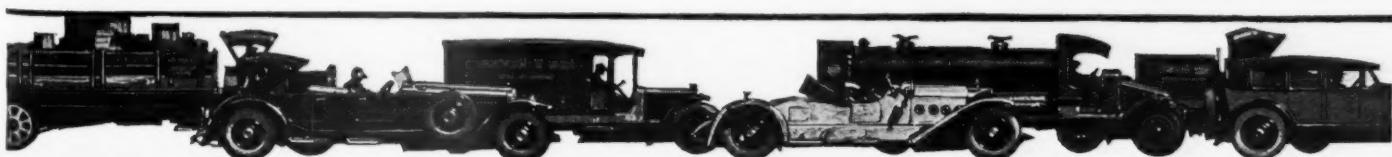
Our experience of seventeen years in working out the practical problems of spring suspension has been of untold value to our customers.

And in the actual making of the springs, our knowledge of steel and of heat treatment, our insistence on a uniformly good product, and our willingness to give extraordinary service when necessary, are mighty good reasons for the wide spread preference for "Perfection."

SPRINGS

An EATON  PRODUCT

The EATON AXLE & SPRING COMPANY
CLEVELAND





Check Your Cable Requirements With This Packard Wiring Chart

Tells you instantly the proper cable for ignition, starting and lighting.



More than 300 of the leading jobbers handle the Packard Line of Automobile Cable exclusively.

Packard Cable is a *unit of good repute* used as standard factory equipment by 72 out of 106 car manufacturers and 44 out of 56 truck manufacturers.

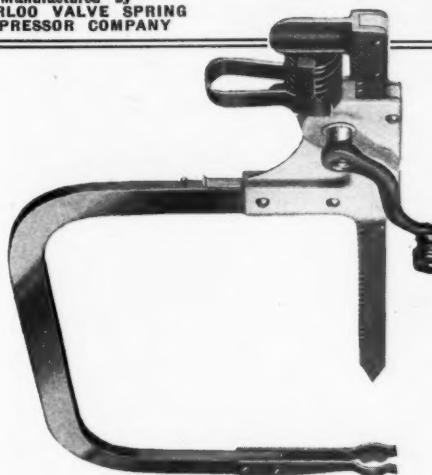
CATALOGED
in the Red Directory

Write for the free wiring chart today.

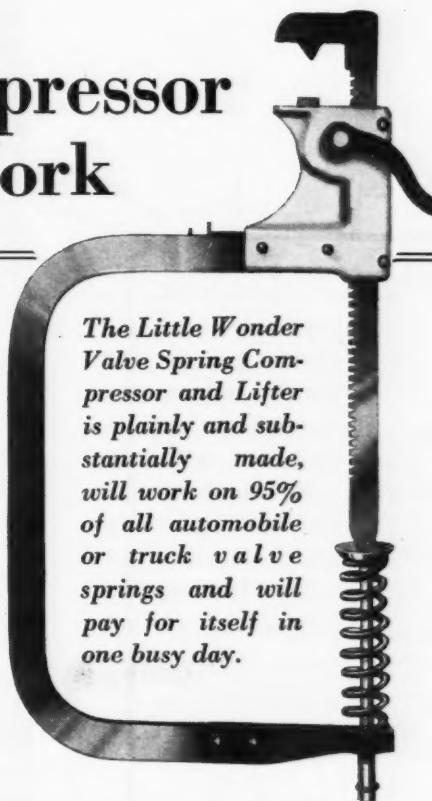
The Packard Electric Company
Warren, Ohio

AT LAST! A Valve Spring Compressor That Does the Work

Manufactured by
WATERLOO VALVE SPRING
COMPRESSOR COMPANY



*It
Handles
Them
All*

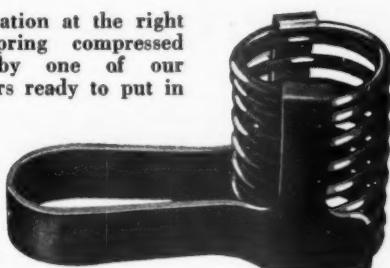


*The Little Wonder
Valve Spring Com-
pressor and Lifter
is plainly and sub-
stantially made,
will work on 95%
of all automobile
or truck valve
springs and will
pay for itself in
one busy day.*

LITTLE WONDER VALVE SPRING COMPRESSOR

This tool compresses the spring and holds it until the lock nut, pin, horseshoe, or half moon, whichever it is, is removed. Release the tool and you can take out the spring and valve, retaining the locking device in your hand. No slips, no skinned knuckles, no lock nuts in the oil pan

The illustration at the right shows a spring compressed and held by one of our spring holders ready to put in place.



One of these
clips or holders
will fit or hold
95 per cent of
all automobile
and truck valve
springs.

or crankcase. It's just as easy to replace spring and valve. The simplest and most efficient tool you have ever seen for this job. The time required to remove a set of valves is only a matter of minutes.

Every Little Wonder is guaranteed for one year against inferior workmanship or poor material. Should any part break from use we will repair or replace it free of charge. The hundreds of mechanics now using the Little Wonder declare it to be one of the biggest time and trouble savers they have ever come across. A user can replace all the valves in a six cylinder engine in a few minutes. The list price is \$8.50. Write for our special price offer to dealers, garagemen and mechanics. Get one of these tools and use it yourself. Give it a thorough trial. If it isn't absolutely satisfactory in every way send it back and we'll refund every penny of your money. That's fair enough, isn't it?

Little Wonder Valve Tool Co.

Not Inc.

SALES DEPARTMENT

606 ONEIDA ST. JOLIET, ILL.

P. O. BOX 1028

Little Wonder Valve Tool Co.,
606 Oneida St., Joliet, Ill.

Without any obligation on my part send me your spe-
cial price offer on the Little Wonder Valve Tool. I
understand if I buy one of these tools I can return the
tool any time within ten days and you will refund my
money.

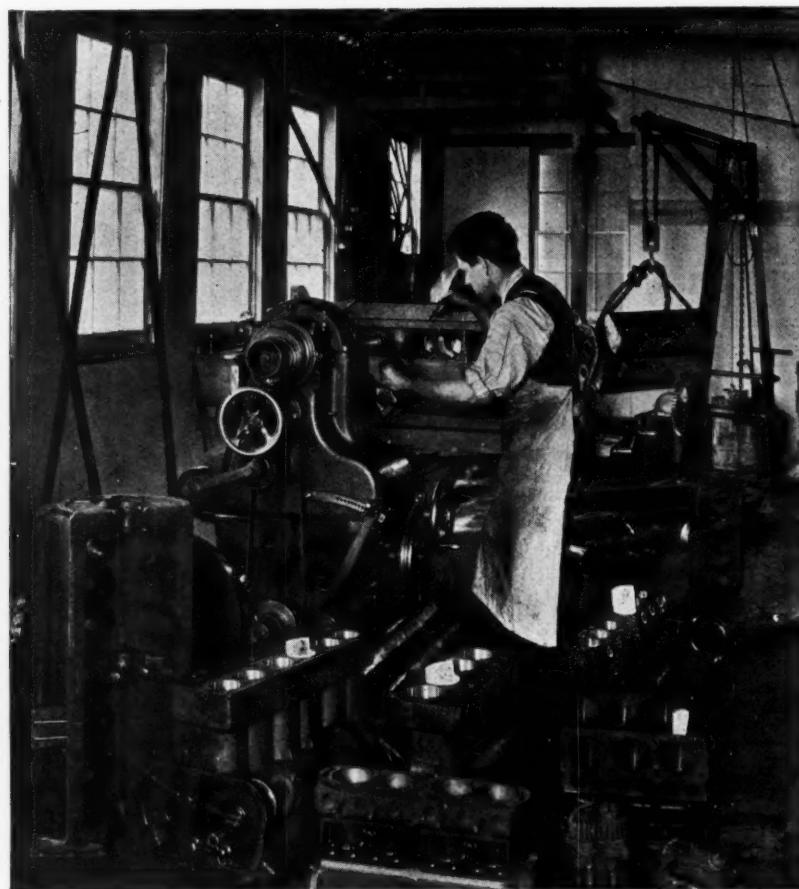
Name _____

Address _____

City _____ State _____

**A BIG Machine
Sold at
LOW Price**

Maximum diameter machine will grind.....10"
 Maximum diameter hole machine will grind—regular equipment..... $5\frac{3}{8}$ "
 Minimum diameter hole machine will grind—regular equipment..... $2\frac{1}{2}$ "
 Maximum depth machine will grind with regular spindle15"
 Off center movement of wheel spindle1-1/16"
 Feed of wheel spindle, per revolution of outer eccentric sleeve .0005 to .0015
 Rotary speed of outer eccentric sleeve R. P. M. 40 and 82
 Speed of grinding wheel spindle R. P. M. 5415 and 7075
 Maximum traverse of work carriage..... $31\frac{1}{2}$ "



GRINDING—

*The REAL Way to
re-size cylinders*

Let's not lose sight of conditions AS THEY ACTUALLY ARE.

The cylinders of ALL quality cars and many of the medium and low priced cars are invariably ground. All other methods produce a surface subject to very rapid wear. When wear occurs, the cylinders are OVERSIZE, producing "piston slap," the very condition to be overcome.

When cylinders are ground on a grinding machine, the result is a glass-smooth STRAIGHT, ACCURATE hole, NO particle of abrasive imbedded in the surface of the wall, NOT subject to rapid wear.

Ground Pistons fitted correctly to ground cylinders require little breaking in. They are RIGHT when the job is turned over to the car owner and remain RIGHT.

The LANDIS CYLINDER GRINDING MACHINE is especially well suited for resizing work. Nothing complicated like some machines with their 10 to 12 speeds—the Landis has but 2 traverse speeds, 2 eccentric speeds, 2 spindle speeds. Comes COMPLETE ready to tackle any regular job without the expense of extras. The price is a feature.

LANDIS

LANDIS TOOL CO., WAYNESBORO, PA.
New York Office: 30 Church Street



DURANT MOTORS · INC ·

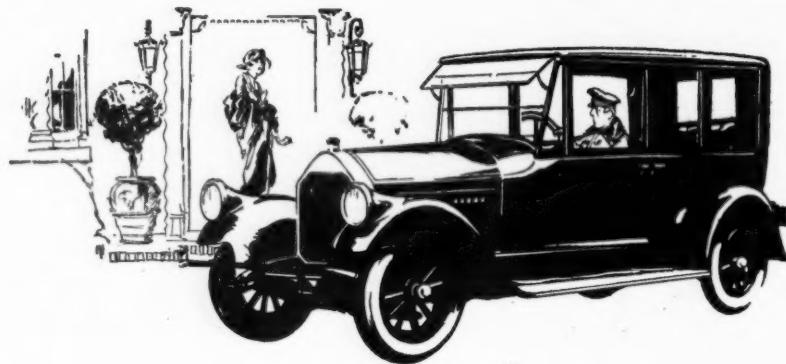
ELIZABETH, N. J.

LANSING, MICH.

OAKLAND, CALIF.

LEASIDE, ONT., CAN.

PIERCE



THE ENCLOSED DRIVE LIMOUSINE

The large number of persons who desire and can afford Pierce-Arrows astonishes those who have not investigated the question.

We have developed an unusually effective method of seeking out these prospective owners. That Pierce-Arrow dealers have been

successful in applying this method is verified by the fact that Pierce-Arrow sales in 1923 have been the largest in Pierce-Arrow history.

We are prepared to discuss the opportunity which is offered by the Pierce-Arrow franchise. It is available in a certain few territories.

THE PIERCE-ARROW MOTOR CAR COMPANY

Buffalo, N. Y.

PIERCE-ARROW

Open Cars \$5250 Closed Cars \$7000

At Buffalo—Government Tax Additional

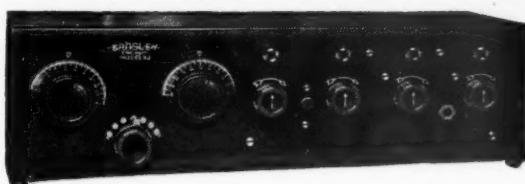
ARROW

"PRIDE OF ITS MAKERS MAKES YOU PROUD IN POSSESSION"

(268)

Radio -

The automotive dealer's field for additional profits



CROSLEY MODEL X-J PRICE \$65

As an example of the exceptional value of all Crosley instruments we show above the Model X-J. This is a 4 tube set combining one stage of tuned radio frequency amplification, detector and two stages of audio frequency amplification. We unhesitatingly claim that this is the most popular receiver in the United States today. For bringing in distant stations no set can excel it.

Our Catalog Describes this Model fully.

A new field for greater business is offered to the automotive dealer by radio. Without increasing overhead, radio enables you to balance the sales of the usually dull winter months with those of the prosperous summer months and allows you to keep your trained organization intact.

Wide-awake automotive dealers in all parts of the country are handling the Crosley line of radio receivers and parts. Constructive, consistent advertising over a long period of time has created an ever increasing demand for Crosley instruments. Exceptional performance that gives unusual satisfaction has made thousands of happy customers who tell their friends about results that their "Crosley" has brought.

Make up your mind now to get some of this business that is waiting to come to you.

CROSLEY
Better-Cost Less
Radio Products

Write for Complete Catalog.

This fully describes Crosley instruments and parts.

CROSLEY MANUFACTURING COMPANY
Powel Crosley, Jr., President
12533 ALFRED ST. CINCINNATI, OHIO

The Big Show in a Bigger Place

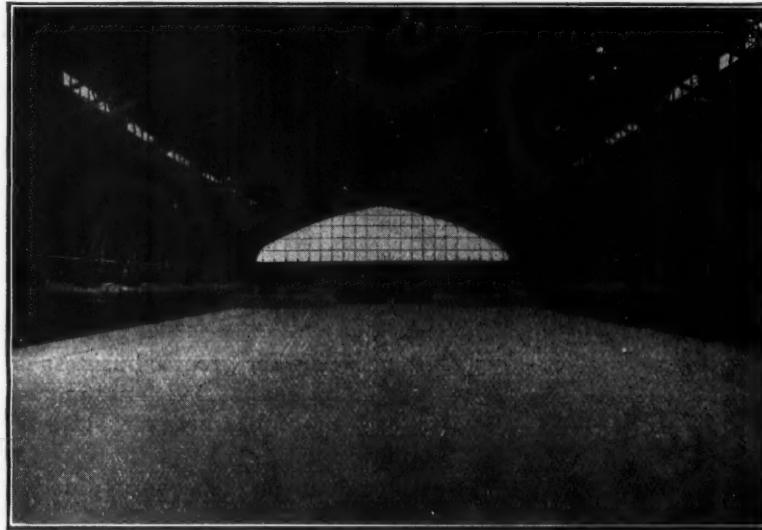
24th Annual National

AUTO SHOW

NEW YORK JAN. 5 to 12

Auspices National Automobile Chamber of Commerce Inc.
SAMILES Manager, 366 Madison Ave, N.Y.City.

No Pillars
No Elevators
No Stairs
A Spacious Restaurant



From your Hotel to Your Display Space Entirely Under Cover

The Armory—180,000 square feet without a post.

It Will be More to Your Advantage to Visit the New York Automobile Show This Year Than Ever Before

THE National Automobile Show in the 258th Field Artillery (formerly the 8th Coast) Armory, will mark the first time since the industry assumed a position of leadership that the stage for the annual exposition has been in keeping with the vastness of the industry.

The Armory is ideally situated

for the convenience of the public, being reached directly by Subway, Elevated and trolley lines. It is only 30 minutes from the down-town hotel section by Subway. There are balcony seats for 2,000 persons, a spacious restaurant and every other desirable convenience.

Chicago Nat'l Show-Coliseum and Armory-Jan. 26 to Feb. 2

The Big Show in a Bigger Place

OLDSMOBILE - SIX

PRODUCT OF GENERAL MOTORS

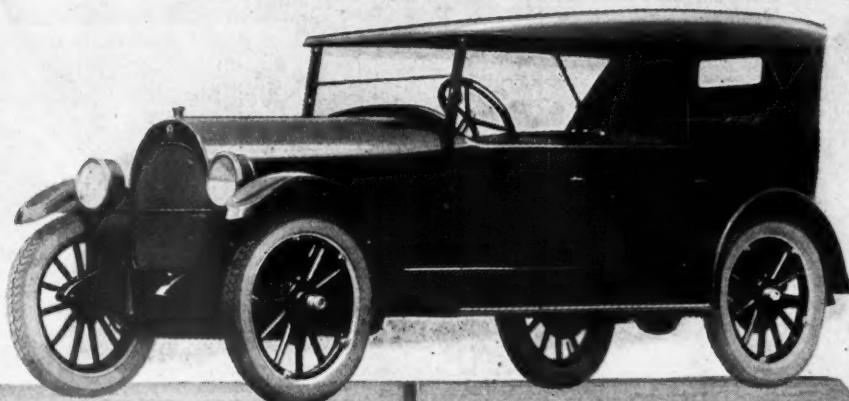
Rests on a Foundation that Spells Success to Ambitious Dealers

You are building a business for years to come—not for this month, or this year, alone. You are anxious to sell a car that is right, that has a big sales appeal, and that has a guaranteed future.

In the interest of business permanence

you can do no less than study our proposition from the angle of Oldsmobile as a car, Oldsmobile as a selling proposition, and Oldsmobile as a permanent division of the great General Motors Corporation.

OLDS MOTOR WORKS, LANSING, MICHIGAN



Value of
Oldsmobile Name

Strength of
General Motors

26 years' manufacturing
experience

36 acres of factory
space

Modern equipment
worth millions

Delco
Ignition

Borg & Beck Clutch

Oversize Tires

Long
Springs

Remarkable Performance

Six Cylinders

\$750 Price

Fisher
Bodies

Economy of Operation

Sturdy Chassis

G.M.A.C. time
payment plan



It would surely be gilding the lily to attempt any addition to this enthusiastic endorsement of ELCAR. Therefore we will simply suggest that if you are not now handling a car worthy of equal enthusiasm, we will gladly respond to a letter with full details of our dealer proposition.

SIXES

Continental Motored
Closed and
Open Models

ELCAR

A WELL BUILT CAR
ELCAR MOTOR COMPANY Elkhart, Indiana

Builders of Fine Vehicles Since 1873

FOURS

***Lycoming Motored
Closed and
Open Models.***

GATES HOSE

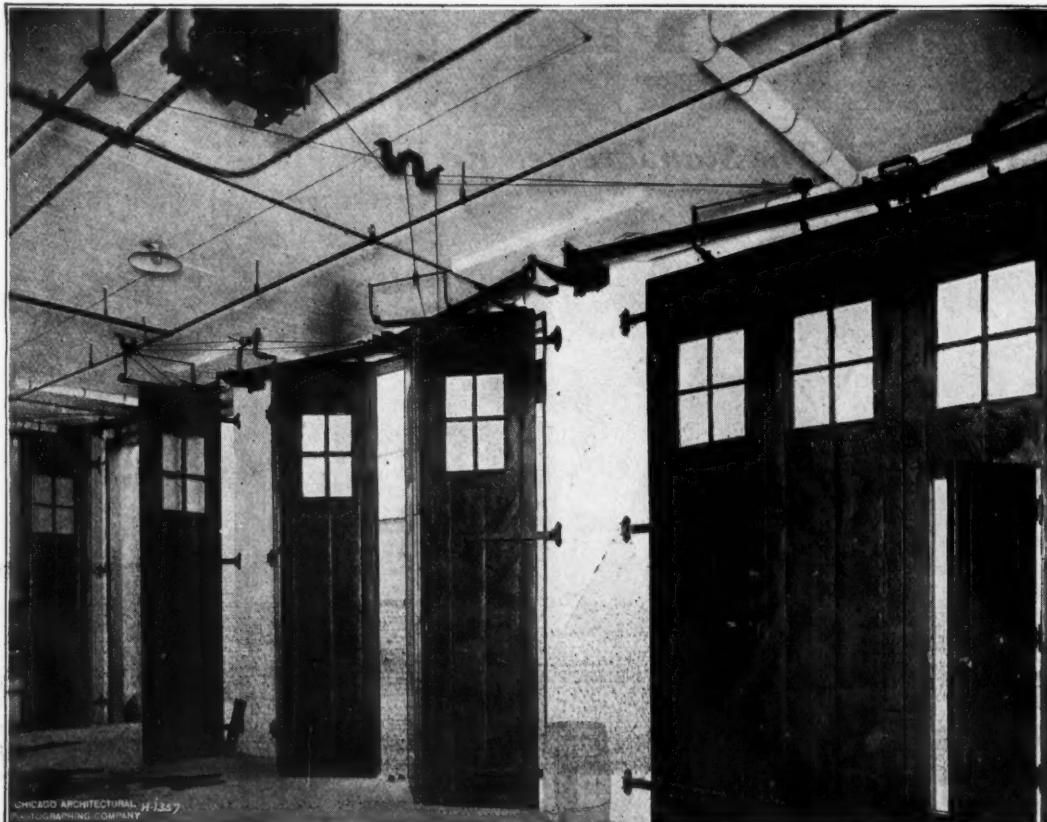
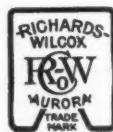
"The Standardized Radiator Hose"



Marked by Inches
Easily Cut to Length

Right at this season,
anti-freeze mixtures
give radiator hose
extra wear—inside.
Especially important
now to protect good
customers by selling
the hose with the
tougher rubber lining.
That's Gates Vulco.

Made by the World's Largest
Manufacturers of Fan Belts.



CHICAGO ARCHITECTURAL H. 1357
PHOTOGRAPHING COMPANY

Stop Big Door Troubles with R-W Electric Operators and *Slidetite*, Garage Door Hardware

The operation and maintenance of big garage doors will sooner or later be a source of trouble and expense unless the doors are properly hung.

"Slidetite" Garage Door Hardware is designed to meet the special requirements of this class of doorway. Through properly distributed support sagging is prevented. Doors slide and fold smoothly and easily to one side, leaving entire width of doorway unobstructed. No surface exposed to the wind, thus preventing accidental slamming. Suitable "Slidetite" equipment can be had for every doorway from the one-car garage to a large opening 30 feet in width.

The illustration shows a complete installation of three four-door sets of "Slidetite" in the new garage of the Hebard Storage Warehouse, Chicago. These doors are operated by the R-W Electric Door Operator, which permits instant automatic control of doors from any convenient point. This entire installation is giving complete satisfaction.

Write for "Slidetite" Catalog X-29, and details of how our Engineering Department can assist you in overcoming any garage door difficulties.

New York
Boston
Philadelphia
Cleveland
Indianapolis
St. Louis

Richards-Wilcox Mfg. Co.

"A Hanger for any Door that Slides."

AURORA, ILLINOIS, U.S.A.

RICHARDS-WILCOX CANADIAN CO. LTD.

Winnipeg LONDON, ONT. Montreal

Chicago
Minneapolis
Omaha
Kansas City
Los Angeles
San Francisco

MotoreX Sales Data

MEANS
MORE SALES

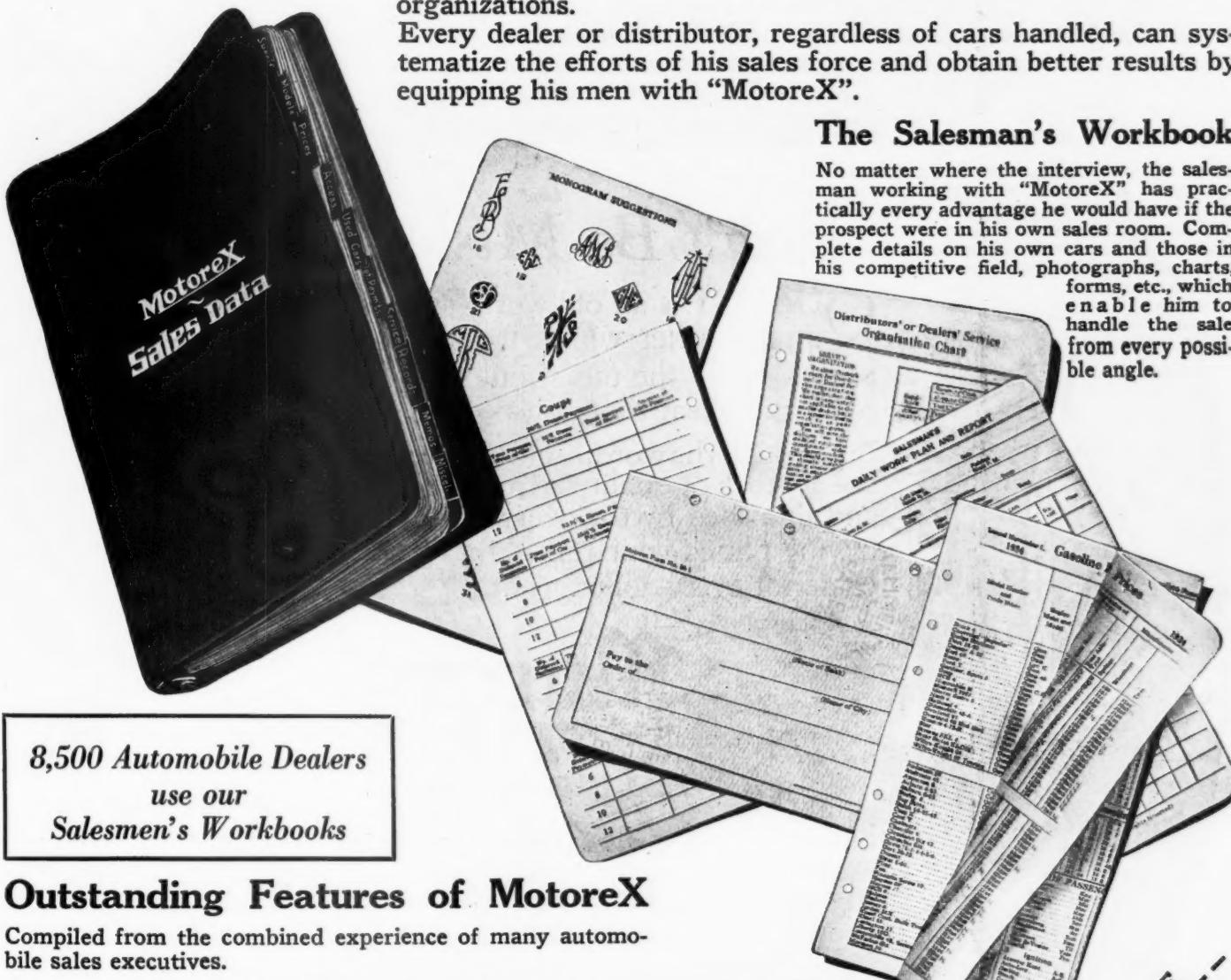
Know Your Stuff

"MotoreX" SALES DATA was compiled and published for the purpose of increasing the productiveness of Automobile selling organizations.

Every dealer or distributor, regardless of cars handled, can systematize the efforts of his sales force and obtain better results by equipping his men with "MotoreX".

The Salesman's Workbook

No matter where the interview, the salesman working with "MotoreX" has practically every advantage he would have if the prospect were in his own sales room. Complete details on his own cars and those in his competitive field, photographs, charts, forms, etc., which enable him to handle the sale from every possible angle.



**8,500 Automobile Dealers
use our
Salesmen's Workbooks**

Outstanding Features of MotoreX

Compiled from the combined experience of many automobile sales executives.

Over 250 pages of valuable information and sales data, so arranged that it can be shown to prospects.

Specifications, prices, weights and motor numbers of practically every model and make of car.

Original "Charts and Forms", practical in application for systematizing the salesman's efforts and summarizing his results.

New method of arrangement using ten leather index tabs, four different colors of paper and unique type arrangement, so that any subject can be instantly found.

Leather finished ring binder, using standard loose-leaf sheets, size $7\frac{1}{4} \times 4\frac{1}{4}$ inches. Extra large capacity permits inserting your own supplementary sheets. (Coat pocket size.)

SALES EQUIPMENT COMPANY

PRICE
\$5.50
Postage
Paid
Export Shipment
Duty Collect

SPECIFY MAKES of CARS YOU HANDLE
SALES EQUIPMENT COMPANY
5981-B Woodward Ave., Detroit, Mich.
Enclosed find \$
below find \$
at \$5.50 each, copies of MotoreX Sales Data
Name.....
Address.....
City.....
State.....
2

Don't Be Misled

QUALITY is an old word, and like many other words it has often been used by the unscrupulous to deceive and cheat the unsuspecting. But though the word, itself, has been abused, the absence of quality is quickly discovered and punished by the overwhelmingly large buying public which insists on getting full value for every dollar spent.

**Murray
"NOT A WORRY" TIRES
FULL OVERSIZE**

have been tested for quality and found to live up to the full meaning of the word. Last year "just a new tire," today it is the most sought after tire on the market by people who have come to realize that, after all, long mileage, dependability and satisfaction are the only factors to be considered in the purchase of a tire.

1923 IS A QUALITY YEAR!

**Every Murray Tire
a Sou'-Easter**

Made and tested for the south-east wheel, where the traffic is roughest. The reinforcement on the side wall gives "truck-tire" strength where the strain is hardest.

**Write Dept. 1312 for our
Exclusive
Dealers' Proposition**

Be the sole distributor in your community for this quality profit-bearing tire. We will be glad to discuss our distribution plan with dealers and show how we can sell such a good tire at such a low price.

**MURRAY
RUBBER COMPANY
TRENTON, N.J.**

**Get
1000
pounds
of
Super-dry
power
\$55**

*The New
U. S. Special
Garage Drill*

Our manufacturing department says of this drill, "It goes the limit in power."

Automotive maintenance men who have seen it say, "It's just right—in weight—in power—in price."

**Same features that have made U. S. Drills
the choice of good mechanics everywhere
with a little plus of its own.**

Write for details or see your jobber.



*Write for catalog 21-C and
special data on this new
super light weight drill.*

**The UNITED STATES
ELECTRICAL TOOL CO.
CINCINNATI, OHIO.**

District Sales Offices and Service Stations

Boston	Detroit	New York
Buffalo	Houston	Philadelphia
Chicago	Kansas City	Pittsburgh
Cleveland	Milwaukee	St. Louis
Columbus	Minneapolis	Toledo

Complete stocks carried in all service stations

UNITED STATES Portable Electric DRILLS

“The Good Mechanic Knows”

Kuehne

Taxi Bodies

COMPLETE your line and overlook no profit.

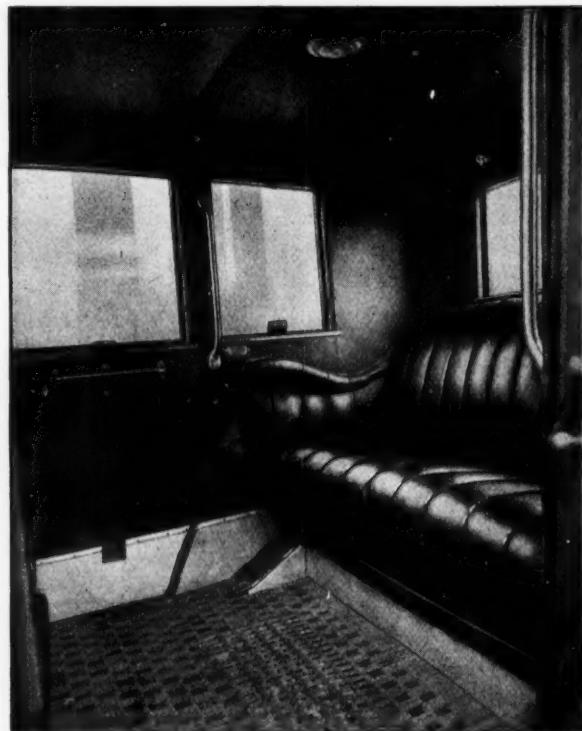
Profits from taxicab sales are so easily made and so numerous that no dealer can afford to omit taxi bodies from his line.

Building thousands of bodies has taught us just what keeps a taxi out and earning. So when you sell a Kuehne body you are sure of a satisfied customer—and you'll probably sell another chassis to go under it. Yes, they last that long.

Comfort for the passenger and driver; rugged strength to withstand long runs and rough going; permanently attractive good looks are all built *into* every Kuehne body.

Ask now about the Kuehne free mounting service.

Open Up
New Fields
of Profit

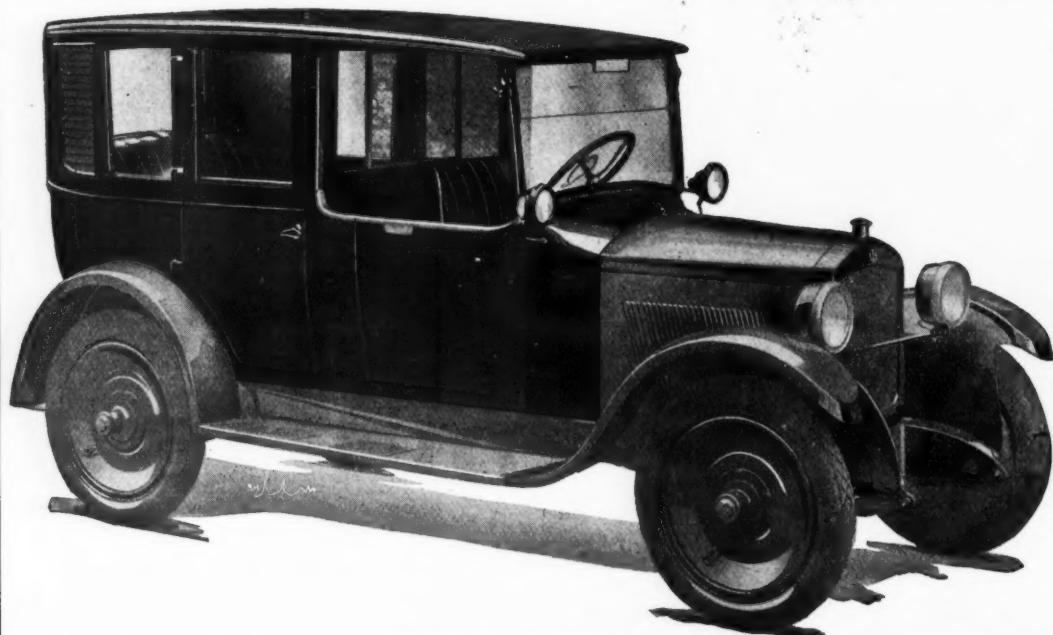


L.F. Kuehne Co.

2609 Archer Avenue,

Chicago

"Coach Makers Since 1888"



The
Well-Dressed
Taxi
Gets the Call!

A Merry Christmas and A Happy New Year To You All

We'd like to get right out into the field — shake hands with all our good friends in the Trade — and personally wish them Christmas Cheer

But we can't very well and so we're taking this means of getting our message to you.

It's mighty fine to have your Good Will — our business couldn't have progressed and expanded, as it has, without it.

We try to do our best every year to please you and give you good service and we must have succeeded because you have supported us loyally — 1923 was another fine year for us.

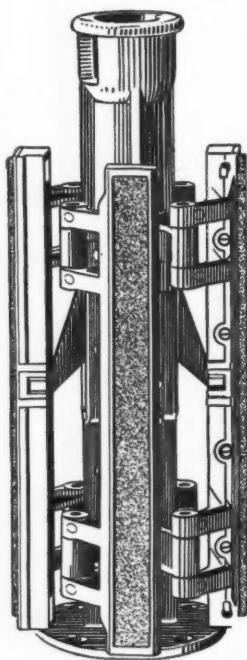
We appreciate this very much and we certainly extend to you the Greetings of the Season, wishing you a Right Joyous Christmas and a Bright, Prosperous New Year.

Universal Industrial Corporation
Hackensack, N. J.





Honing on the chassis —is better for the motor —and bigger for your profit



Reconditioning cylinders by the Hall Cylinder Hone method is not only quicker—it is better.

There is no time spent taking down the motor and then remounting. The owner's car is not laid up more than a few hours. You can handle three times as many jobs as by the old method.

The Hall Cylinder Hone operates first on a parallel principle. The stone carriers are rigidly hinged top and bottom and cannot follow a taper.

The oval principle is also important. The expansion of the stones is controlled by one central spring and this expansion is confined to the shortest diameter of an oval worn cylinder. The oval cannot be followed.

Send for our free booklet that gives all details and tells how a \$50 investment will increase your business and profits.

The Hall Cylinder Hone
Company
437 Dorr Street, Toledo, Ohio



Receivers' Sale in Equity

In the District Court of the United States for the eastern district of Pennsylvania. In Equity. December sessions 1922. No. 2685.

**VALUABLE PLANT OF THE
DANIELS MOTOR COMPANY
At Reading, Pa.**

**MONDAY, JANUARY 14th, 1924, and
TUESDAY, JANUARY 15th, 1924
at 10 A. M. EACH DAY
On The Premises**

Real Estate—Four story brick "U" shaped Factory, with power plant, elevators, Railroad siding, large suite of offices and lot 176 $\frac{1}{4}$ x 229 $\frac{3}{4}$ feet, with frontage on the Reading Railroad. Third Street and Thorn Street. Also Lease on the first floor of the adjoining property.

Service Rights and Good Will—Consisting of large and valuable assortment of parts for repairs of Cars on the road. Patterns, Patents, special jigs, dies, and tools, right to receive mail, etc.

TO BE SOLD IN PIECEMEAL LOTS ONLY

Machinery and Equipment—Comprising a modern Machine Shop recently equipped with Cincinnati plain and vertical millers, Walcott, Lodge & Shipley Lathes, Beckford radial drills, Heald grinders, Garvin profiler, Moline hole hog, Brown & Sharpe universal grinders, Bullard Turret lathe, Brown & Sharpe hobber, Gould & Eberhardt shaper, Generator sets, motors, etc., Blacksmith Shop, small tools, nickel plating outfit, Woodworking Equipment, including Tenoner, boring machines, dado machines, shapers, jointers, planers, saws, etc., Metal working equipment, including hammers, saws, grinders, polishing lathes, Air compressors, etc.

Stock and Fixtures—Comprising sheet steel and aluminum, nuts, bolts, lumber, leather, upholstering materials, large number of bodies, some completed and some partially completed, also office equipment, oak and mahogany; Typewriters, Adding Machines, Calculators, etc.

NOTE: The plant will not be offered as an entirety.

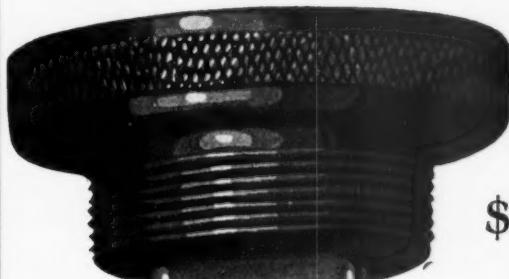
By order of C. VERNON BRADFORD } Receivers
GEORGE C. TENNEY }

MORGAN, LEWIS & BOCKIUS, Attorneys for Receivers,
934 Land Title Bldg., Philadelphia.

Catalogues with terms, full description of property and itemized list of equipment will be mailed upon application to the Auctioneers.

**Samuel T. Freeman & Co., Auctioneers,
1519-21 Chestnut St.
Philadelphia, Pa.**

For "CHEVROLETS"



\$1.25

A "TASCO" Visible Gas Gauge

Replaces cap in gas tank. Just screw in in place of gas cap—and the job is done.

Quick, efficient, durable, lasting, unfailing in operation. A sure-fire rapid seller.

For FORDS A "TASCO"

Visible Gauge
at the same price,
\$1.25

Takes place of regular gas cap underneath seat cushion. Just lift cushion—and you get the reading.

Two big sellers.
Both real utilities—
both reliable.

At your jobbers or
write direct. Distributors get our
proposition.

The Akron Selle Co.
AKRON OHIO

*the eyes open
the pocketbook—*

Nobody but a blind man buys things without seeing them. And the more we see the more we buy. The Sherer Accessory Case gives you attractive display under glass. Sell your accessories with a

SHERER ACCESSORY DISPLAY CASE

The case shown below has a false back covered with green felt giving an effective display—displays everything from tires to spark plugs. Makes them all sell easily.

In addition—behind the false back there is a set of fine, roomy, easy-working drawers where you can store your accessories. You sell from the drawers—the displays are not disturbed. This makes the Sherer Case a double-purpose case.

For more than 70 years we have manufactured and sold storage equipment of the better sort. Write in today for our catalogue.

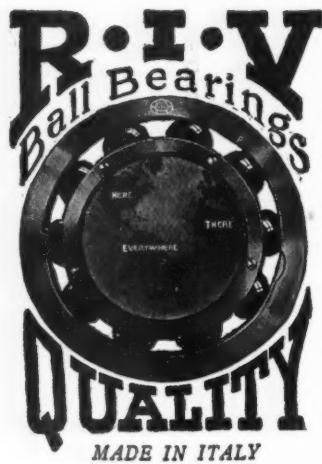
SHERER-GILLET CO.
17th & S. Clark Sts., Chicago



Clever!

Just under the top glass there is a shelf for small articles. It is reached by a drop string door.

Notice the drawers—they are 14½ in. long and 11¾ in. wide and are in three depths—3¼ in., 7 in. and 15⅜ in. Takes all kinds of accessories. Sherer Accessory Display Case is furnished in three standard lengths as follows: 8 ft. 8 in.—12 ft. 2 in.—15 ft. 10 in.



MADE IN ITALY

A Money-Making Chance for Ball-Bearing Distributors

WE have openings RIGHT NOW for distributors and sub-distributors who do a reasonable volume of business, and want to build a permanently profitable trade with a ball-bearing of high quality and competitive price.

R. I. V. quality is known and accepted by every engineer and service man in America. The R. I. V. policy is "live and let live"—scores of satisfied distributors will endorse that statement.

We hold in warehouse in New York at all times MORE THAN A YEAR'S SUPPLY of R. I. V. ball bearings for the replacement trade—an unequaled guarantee of prompt service.

Write us NOW—and begin 1924 with the R. I. V. line—the best all-round proposition in the business.

1755 Broadway



New York City

SMITH'S A-MAL-GAM

FORMS A PERFECT BOND
BETWEEN CAST IRON AND BRONZE

A faster, better way to weld cracked cylinder heads and motor blocks. With Smith's A-MAL-GAM, you can do all your cast iron welding jobs right in your own shop and in most cases without pre-heating.

This new method enables you to keep all the profits yourself. No need to send it out to others. Order today and commence welding the better way.

SMITH'S INVENTIONS, Inc.

2625 4th St. S. E.

Minneapolis, Minn.

Send
No
Money

Just pay the postman \$3.25 plus postage for 1 lb. can when delivered. If it doesn't do all we say your money refunded. Order today.



Selling trucks and buses is easier when you know the owner's viewpoint

Read *Motor Transport*.

It tells you the problems of the Fleet Owner. It tells you how Fleet Owners are making and can make a success of truck or bus operation.

Just as *Motor Age* tells you how to handle your business, so *Motor Transport* tells how to efficiently operate fleets of motor trucks and buses. Reading *Motor Transport* will make you a better dealer.

Recommend fleet owners to whom you have sold trucks or buses to subscribe for *Motor Transport*. This magazine will make them more efficient operators.

You will both benefit!

Motor Transport is published semi-monthly, on the 1st and 15th. The subscription price is \$2.00 per year (\$2.50 West of the Mississippi).

Write for a sample copy.

Motor Transport

FORMERLY COMMERCIAL VEHICLE

(Published by the Class Journal Co.)
239 West 39th St. New York, N. Y.



Where no other could— “YANKEE” Ratchet Breast Drill

Works efficiently and quickly in the most cramped places. The “Yankee” DOUBLE Ratchet makes the job almost as easy as if you had the work in a vise. You don’t have to make a complete turn of the crank—just place the drill against the work and move the crank back and forth, only an inch or so, and the bit cuts continuously. No other breast drill can do that.

Speeds up the work. Takes the back-breaking labor out of drilling. A finger touch gives any one of the five adjustments. Has two speeds which can be changed instantly without removing drill from work. Just shift lever at base of hub.

Dealers everywhere sell “YANKEE” Tools



A postal
will bring
you Free
Tool Book

Illustrates and de-
scribes all the in-
genious “Yankee”
Tools for saving your time and your
muscles.

Some other
“YANKEE” Tools

Ratchet Screw-drivers
Ratchet Hand Drills
Ratchet Chain Drills
Ratchet Bench Drills
Ratchet Tap Wrenches
Bench Vises

NORTH BROS. MFG. CO., PHILADELPHIA, U. S. A.

“YANKEE” TOOLS
Make Better Mechanics

30 Per Cent Stronger-- Tougher!

We take pleasure in announcing a new type of Victor Cap Screw for commercial use. The New Victor Cap Screw is far in advance of all previous commercial cap screws.

Already known throughout the industrial world for their tough strength and freedom from crystallization and weakness, the New Victor Cap Screw is 30 PER CENT STRONGER AND TOUGHER.

Our chemists have developed a much better type steel for use in manufacturing screws. This steel contains a higher carbon content.

We are able, therefore, to guarantee our customers — at no greater cost—Cap Screws that are at least 30 per cent stronger and tougher than any yet produced for commercial use.

VICTOR-PENINSULAR CO.
DETROIT, MICH.

Bosch

The Finest Magneto In the World
ZU4

A Sales Alliance
with the genuine, original Bosch in 1924 will prove a splendid resolution for you.

The Robert Bosch Selling Franchise
means prestige and profits.
Write or wire.

Robert Bosch Magneto Co., Inc.
Otto Heins, President
123 West 64th Street New York
Chicago Branch: 1302 South Wabash Ave.
Service Stations in Principal Cities the World Over.
The Genuine, Original Bosch means Robert Bosch only.



Buy the Shop a Gift

Make your shop a Christmas gift of an Eagle Aligning Fixture. It's an appropriate gift that will give you a quick, accurate way of proving wrist pins, bushings, connecting rods and pistons.

The Eagle Aligning Fixture has five adjustable patented bushings, making it possible to detect any bend or twist in connecting rods having bearings from $1\frac{1}{8}$ " to $2\frac{5}{8}$ " in diameter. The Eagle is a gift the boys in the shop will like and it will make more profits for you through satisfied customers.



Order from your jobber, or write us for details.

EAGLE MACHINE CO.

24 N. Noble St.,
Indianapolis



BLAKE SHOCK ABSORBERS

*The Harder
The Pull
The Harder
They Pull*



That is what makes them sell. They severely check the big rebounds, and only slightly slow the small ones. That makes the springs act as cushions instead of kicking like mules. The result is a velvety wave action that makes the roughest road almost as smooth as cement.

You can easily sell so good a shock-absorber. The profits are large, especially on the model for Fords, priced at \$25.00 per set of four.

Blake absorbers are adjustable just by removing one nut. They are made in three sizes, so you can sell the whole market from just a small stock. They are self-compensating for wear, so service is not bothersome.

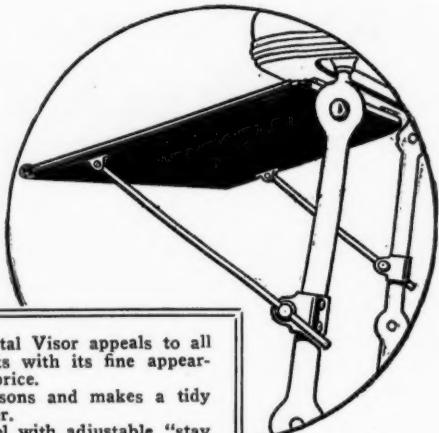
Some mighty good territory is still open. Send for our liberal plan which will make your neighborhood pay you good money. Write now.

**BLAKE AUTOMOTIVE
EQUIPMENT CORP.**

1439 North 13th St.

St. Louis, Mo.

For Sunshine or Storm in all Seasons



The Higgin all-metal Visor appeals to all classes of motorists with its fine appearance and popular price. It sells in all seasons and makes a tidy profit for the dealer. Made of sheet steel with adjustable "stay put" brackets. Finished in baked enamel—black outside—green inside. A gutter on the lower edge drains water over the side. Made for all cars including Fords. Our selling plan gives you protected territory and real selling assistance. Write for it.

THE HIGGIN MFG. COMPANY
Automotive Division, Newport, Ky.

**HIGGIN
ALL-METAL
VISOR**

Installed with a screwdriver in twenty minutes on open or closed cars. Strongly made. Cannot rattle, flop, tear or crack.

Sells for
\$3.50

and nets a big profit.



SAFETY Front Wheel Brakes

Can be attached to ANY MAKE of car. Wonderful overhaul opportunity as every motorist wants to be up-to-date. Operates from the regular brake-pedal. Permits any car to stop in less than HALF THE DISTANCE required with rear wheel brakes alone. Safety feature appeals to all—especially women-drivers. Absolutely no danger of skidding.

Don't pass this up. It is one of the biggest money-making opportunities you will have this year. Write us NOW about this. Big discounts.

GREEN ENGINEERING COMPANY

740 MAIN ST., DAYTON, O.

Distributors for Front Wheel Brakes only. H. F. Morgan, Tampa, Fla.; Reid Air Spring Sales Co., Pittsburgh, Pa.; Clarion Buick Co., Clarion, Pa.; Kittanning Buick Co., Kittanning, Pa.; F. L. Wierick, San Pedro, Cal.; Walker Auto Supply Co., New Kensington, Pa.; John J. Schiffmacher, Brooklyn, N. Y.; John B. Mosey, New York City; McCarthy Bros., Inc., Philadelphia, Pa.

HYDROMETERS
Do Not Wear Out
They Break

"Break-Not"
Storage Battery Testers

ALL THAT
THE NAME IMPLIES

The MOST WIDELY ADVERTISED
BATTERY TESTER in the WORLD

Its many patented features guarantee a
Battery Tester of rare reliability.

Drop it on the floor—it will not break.

It is cushioned between the patented rubber
housing and the bulb.

The three-colored float can be easily read—
even at a distance.

SHOW THE 'BREAK-NOT'
SELL THE 'BREAK-NOT'
MAKE A BIGGER PROFIT

E. EDELMANN & CO.
Chicago. U.S.A.

Price \$1.00
and Worth it
EAST OF ROCKY MOUNTAINS



Are You Ready for
the Profit?

GENUINE APEX INNERINGS (INSIDE PISTON RINGS)

Are in Nation-Wide Demand

by car owners, mechanics, garages. This original, pioneer device is the only one of its kind fully guaranteed to

STOP PISTON SLAP—OIL PUMPING

fouled plugs, excessive carbon and to restore power and economy in all types of gas motors—and it is fully established everywhere. Get in on the big and increasing demand for only Genuine APEX INNERINGS. No expensive cutting and fitting required—Apex are made in all standard and "over" sizes. Retail price only 20c each for sizes up to $\frac{3}{4}$ " wide or 5" diam. Larger 35c.

Dealers: Order from your jobber or write us direct sending his name. Jobbers: Responsible houses everywhere are enjoying a tremendous turnover. Write.



They Protect Thoroly—Fit Perfectly

Campbell Radiator and Engine Covers are tailored to fit snugly and smoothly—to give absolute protection against winter blasts, snow and sleet.

No stretching is necessary when adjusting the cover, there is no unsightly overlapping—no bagging. Every Campbell Cover is custom-cut for each model of car. Skillful workmanship, trimness and durability are combined to make them distinctive in appearance and to give the maximum of service to the motorist. Dealers write for literature and prices.

Demand that your Jobber carries



Campbell

Radiator and Engine Covers
Scientifically tailored to fit almost
every model of every make of
American car.

New York

The Perkins-Campbell Co.
622 Broadway, Cincinnati, Ohio



Chicago

MORE CUSTOMERS
and
MORE PROFITS
with

FOSTER

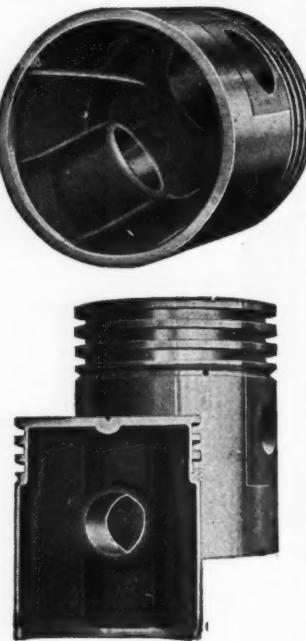
Sensible lightweight
PISTONS

Foster quality and service insures satisfied customers, increases your service and reduces the cost of sales.

That you may judge Foster quality, we will at your request promptly forward a sample half piston and our large list.

Send today.

FOSTER-JOHNSON REAMER CO.
1050 Beardsley Ave. Elkhart, Ind.



WORKS BOTH WAYS

The hydraulic principle takes up the road shocks—controlling the spring action both ways—up or down.

Hydraulic Spring Control provides spring action similar to the effect of a man diving into the water—his body displaces his weight through the opposing force of the water.

This principle controls the springs—it does not prevent their action. The greater the shock—the greater the opposing hydraulic force. A smooth even force that absorbs all shock.

Easy to install, long life (all working parts in oil), an unusual record of service, make the 2-Way Shock Absorber an exceptional proposition for live dealers.

Write for full details.

2 WAY
HYDRAULIC
SHOCK
ABSORBERS

AUTO SPRING
CONTROL CO.
Jamestown, New York

Most Complete Line
Manufactured in the
United States

Dependable
Reamers

SPRAL FLUTE

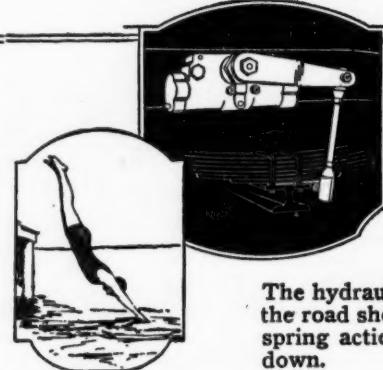
TWIST DRILL

MOORE & MOORE INC.

TAP

SPECIAL TOOLS FOR EVERY MAKE OF CAR

Moore & Moore, Inc.
Reading, Pa.

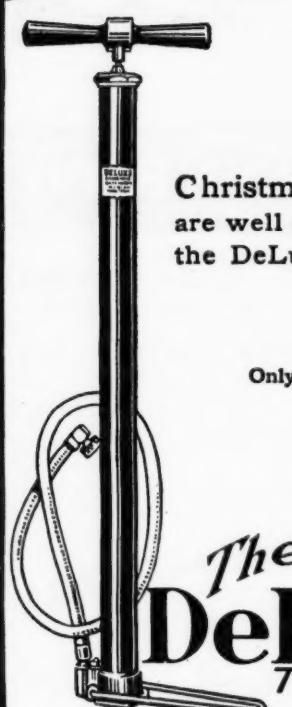


A double-headed piston, within a cylinder of oil—its action governed by the pressure of oil, allows full spring flexibility yet prevents violent road shocks.

The greater the shock the greater the oil pressure.

Smooth, even, riding must accompany hydraulic control of the springs.

DE LUXE
Products
For the Motorist's Comfort



Christmas Greetings
are well expressed with
the DeLuxe Tire Pump

Only \$3.50 Retail

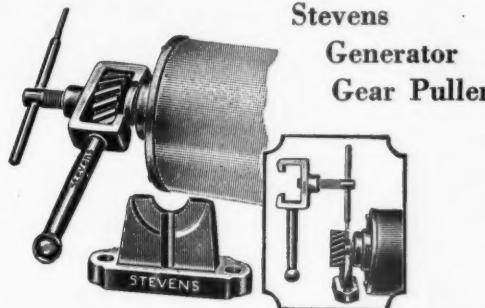
ORDER DIRECT
SPECIFYING
JOBBER

The
DeLuxe
TIRE PUMP

Also
ARVIN HEATERS
DE LUXE,
DE LUXE VENTILATORS

INDIANAPOLIS PUMP & TUBE CO.
INDIANAPOLIS

See how complete—



Stevens
Generator
Gear Puller

IT'S typical of Stevens "Speed-Up" Tools that they are designed with just those extra details that do a job COMPLETELY. Here in this Generator Gear Puller for Ford, a punch is cleverly machined into the handle; there's a convenient holder for the puller, and a grooved block to receive the pin and take the strain off the bearings. It's this "Speed-Up" completeness which makes the Puller the quicker, safer method of replacing the gear. Ask for T-180, \$2 net. CATALOG MA IS LOADED WITH EXTRA PROFITS FOR YOU—WRITE FOR IT.

Stevens & Co. 375 Broadway, New York

"Thru your jobber—his service is economy"

100 Special Tools—Each Fits a job

Stevens SPEED UP Tools

**It's Easier To Sell The
CIRCLE S
Automatic Windshield Cleaner**



List
Price
\$5.00

More Power!

Because There Is
No Internal Friction

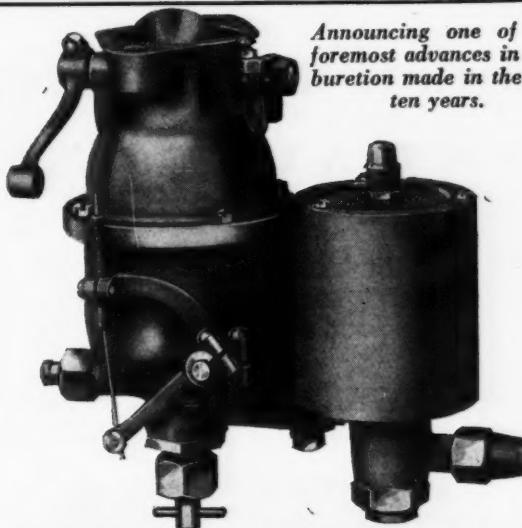
Car owners are quick to appreciate the superiority of the "Circle S." It's simple, trouble-proof mechanism—Inside adjustment—Variability of the squeegee pressure against the glass—That it can be operated by hand—plus its low selling price of five dollars, insure easy selling to nine out of ten you show it to.

Write Us Today For Details & Discounts

F. W. STEWART MFG. CORP.

356 W. Huron Street, Chicago, Illinois
Manufacturers of the well known "Circle S" Swivel Joints for Speedometers.

Announcing one of the foremost advances in carburetion made in the last ten years.



HESS CARBURETORS

A radically different carburetor in principle, specifically designed and built to handle PRESENT DAY fuel with the utmost efficiency and economy.

Greater saving, faster acceleration; better performance in general assured.

The product of 20 years' experimentation.
In successful use on 34 makes of passenger cars and trucks, adapted to practically all makes of passenger cars, trucks and tractors, made in S. A. E. standard carburetor sizes.

Dealers and Distributors

Good profit making proposition for dealers and distributors in unoccupied territory. Write for illustrated descriptive folder, prices and full information.

Hess Carburetor Co., 511 Lieb St., Detroit



**Dunn Hot Dome Short Manifold
For Chevrolet Superior and 490**

At the first few explosions the Manifold Dome gets sizzling hot from the exhaust gas passing through the Dome Cap. The spray of gas from the carburetor nozzle is forcibly thrown against this intensely hot dome and it breaks up completely, delivering a dry highly explosive gas.

Cold weather starting is easy and mileage is greatly increased. No need to be continually pulling the choker—no more flooded cylinders, wet plugs and diluted lubricating oil. Factory tests obtain 38 miles per gallon. Owners can reasonably expect 25 to 35.

The Dunn Hot Dome Short Manifold is easily installed. No change in original controls. All necessary bolts and fittings furnished. Retail price \$7.50 with liberal discount to dealers and jobbers.

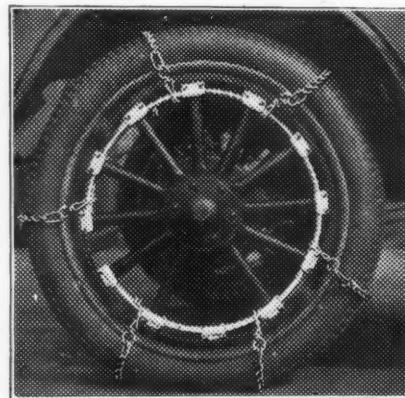
Money back in thirty days, if not satisfied.

Dunn Manifolding Co.
106 Main St. Clarinda Iowa U.S.A.

**At the First Raindrop
Put TRAVELON in
Your Show Window!**

Write for Discounts

The SHAW-WALTON CO. Pontiac, Ill.



There's a GILLIAM Bearing for practically every application and every location in every make of automotive equipment.

Cups Cones Rollers
Alloy Steel Throughout



THE GILLIAM MFG. CO. Canton, Ohio

**JOHNSON No. 8
Adjustable Torch**

Is inexpensive but a necessity for every shop. This Torch is fitted with one Powerful Johnson Gas Burner, which will quickly melt 20-25 lbs. of soft metal. The pot can be instantly removed and used for heating soldering coppers, long rods, or Burner can be removed and used as an efficient hand torch.

Write today for descriptive literature of Johnson Appliances.

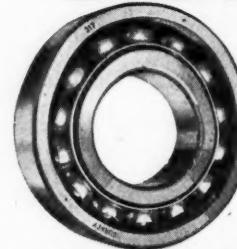


Pacific Coast Representative, C. B. Babcock Co., San Francisco, Calif.



No. 8
Adj. Torch

GURNEY



For Replacement Work choose Gurney Bearings because they have the Greatest load capacity for their size. Ask for circular "Separators, Old and New".

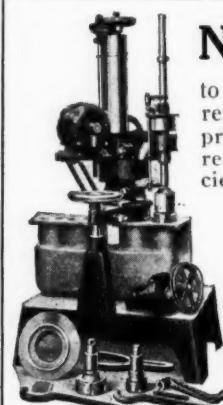
Gurney Ball Bearing Co.
402 Chandler St.,
Jamestown, N. Y.

BALL BEARINGS

18214

NOW IS THE TIME

to be making the big profits from cylinder renewing. The winter months are most profitable to the man equipped to handle reconditioning and rebuilding jobs efficiently in his own shop.

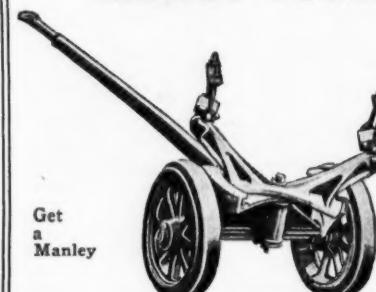


Stormizing Machines

will handle all your cylinder renewing. They enable you to give better service in shorter time and at increased profits. Write today for the Storm Book: Modern Cylinder Methods.

STORM MFG. CO.
406 A Sixth Ave. So. Minneapolis

MANLEY TOWING TRUCKS



Get
a
Manley

Manley Towing Trucks have 100% efficiency for bringing in disabled cars. The Double Post construction straddles the differential and takes the weight off both wheels, making it possible to use the truck if both wheels of the car are damaged, if it has a locked differential or the axle is crosswise. Under these conditions a Single Post tool is useless. Radial Race Ways support the car next to the wheels, massively built of heavy Malleable Steel throughout and 2" telescoping tongue. Roller Bearings are hardened, 100% road clearance. The finest perfection in a Towing Truck.

MANLEY MFG. CO.

YORK, PA.

INSURES A TOW HOME



**BASLINE
AUTOWLINE**

18-196

*Every
Guest
Enjoys*

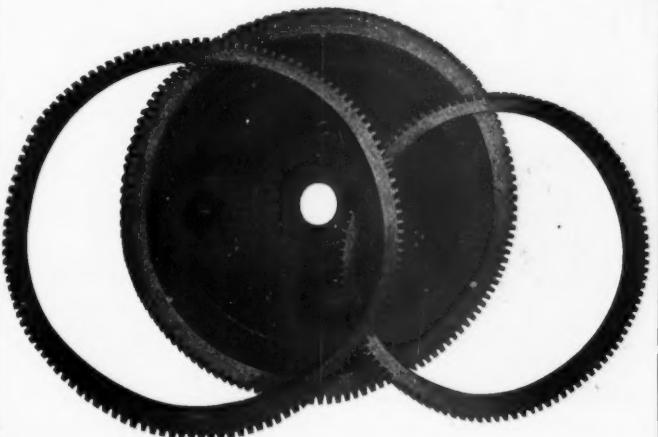
the quiet dignity, the sincere and kindly service and the excellent accommodations of *The Hollenden*. Facing the New Federal Reserve Bank and the Six Million Dollar Public Auditorium, *The Hollenden* is at the center of the civic, social, commercial and financial activities of Cleveland. ~ ~ ~ Matured by years of service under the best principles, every guest receives the welcome that brings travelers back to *The Hollenden* for its kindness and comfort. ~ ~

Roscoe J. TOMPKINS, Manager
IN CLEVELAND
-it's
THE HOLLENDEN

New Low Prices On Fly Wheel Rings

Increased quantity production has enabled us to get out a new and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

The Meachem Gear Corp'n.
Ring Dept. Syracuse, N. Y.



"WHITNEY" HIGH MILEAGE CHAINS

For Front End Drive Replacements

THOUSANDS OF SATISFIED USERS
THE BEST RECOMMENDATION

We Can Furnish Chains for the Following Cars:

Anderson	Franklin	Moen
Cadillac	Hall-Scott	National
Case	Motor	Oakland
Chalmers	Haynes	Packard
Chandler	Hudson	Pan
Cleveland	Hupmobile	Rickenbacker
Columbus	Jeffery	Revere
Continental	Jordan	Saxon
Motors	King	Star
Davis	Lafayette	Stearns-Knight
Drexel	Lincoln	Studebaker
Essex	Lozier	Templar
Fageol	Mercer	Winton
Fox		

When you equip your motor with "WHITNEY" you can forget your chain troubles.

**THE WHITNEY MFG. CO.
HARTFORD, CONN.**

New York L. C. Biglow & Co., Inc. 243 West 55th Street	Boston George C. Stell, 200 Devonshire St.	Philadelphia R. J. Howison 624 Race St.
---	--	---

San Francisco, A. H. Coates Co., 770 Mission St.



*A Greater Service on
a Greater Bearing*

WHEREVER you are, there's one of our more than 400 "Milwaukee" Bearing distributors near you—"not over a day away." The convenience and real money value of a service such as this is evident.

And "Milwaukee" precision-made bearings are *right*—from their virgin metal, perfectly bonded with their husky bronze backs, to their ten micrometer inspections. Write for *FREE* new 68-page Bearing Guide and name of our nearest distributor to you.

Milwaukee Die Casting Co., Milwaukee, Wis.

MILWAUKEE BEARINGS

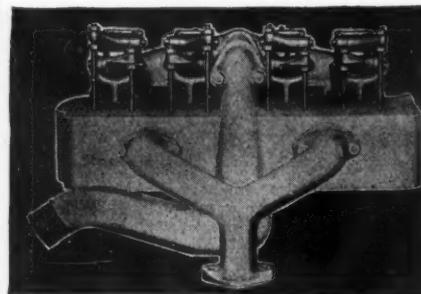
Here Are the Reasons Why You Can Guarantee Our Plates

GENERAL plates are strong and porous; they deliver the current whenever called upon. No chipping out and softening for them,—regular users will tell you that. Write today for information about long-life GENERAL plates or any other battery parts you may need.

"Shop Talk on Plates"
Let us send you this interesting little folder, just chockful of information.

General Storage Battery Co.
2005 LOCUST ST. ST. LOUIS, MO.

ROOF 16 OVERHEAD VALVE EQUIPMENT For Ford and Dodge Motors ROOF 8 VALVE HEAD FOR FORD MOTOR



Jobbers—Dealers—Consumers—Write Us
THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA

FOLLETT'S NEW MODEL TIME STAMP

—accounts for every labor minute



Learn the interesting details from our descriptive data.

Follett Time Recording Co., 7 West Broadway, New York City

Prints the year, month, day, hour, minute, A. M. or P. M. at the exact moment the plunger is pressed—like this, for example:

NOV 19 1920 4 31 PM

Tells when a job is started—and when it is finished. There can be no dispute over the time charge.

Absolutely automatic — except for winding. Special machines, with as many as six different words, can be made. Every machine guaranteed.

BLACK & DECKER



DRILL
With the Pistol Grip and Trigger Switch
\$68.00

THE BLACK & DECKER MFG. CO.
TOWSON, MD.



Franklin

The
Super Single Stage
Air Compressor

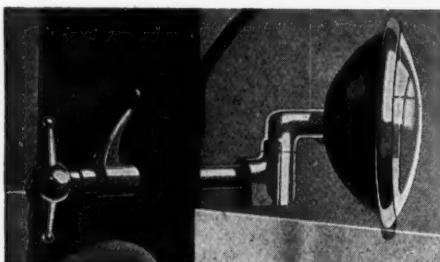
Has no complicated devices, no fancy accessories, no unnecessary parts. Everything strong, durable, with a specially designed compressor having super-cooling spiral cylinder fins. The patented Unloader saves electricity and cuts down repair bills. Standard replacement parts. Order today or write for full particulars. \$225 f. o. b. Norristown.

FRANKLIN AIR COMPRESSOR WORKS
2604 Main Street, Norristown, Penna.

New Departure Ball Bearings

PFAFF SPOT LIGHT INNER CONTROL

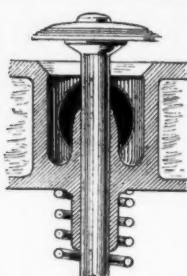
Keeps the driver's arm inside, and the draft off the women in the rear seat. That's why it sells so fast. The quality of the workmanship and material in it keeps it sold. At this price you can make the market yours—with additional profit. Send for full information.



**PRICE
\$10.00**

**Pfaaff
Mfg. Co.
6340 Stewart
Ave.
Chicago, Ill.**

GOLD MINE PROFITS FROM VALVES



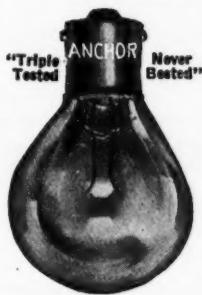
Big Money in Replacements

Dealers and repair shop owners are making the kind of profits that count by installing Boyle Never-Grind. Silent Valves in their customers' cars. They make much more money than they do from grinding ordinary valves. Boyle Valves run from 50,000 to 100,000 miles without any attention, and operate silently. They grind themselves! And the repair man who puts a set of these valves into a man's car gets all of that man's repair work, for Boyle valves always satisfy. They are guaranteed to do that!

BOYLE Never Grind VALVE

The Boyle Valve Company has a profitable distribution plan that is of interest to every repair shop owner, dealer, and jobber. Write for it, and for full particulars regarding the features of this remarkable device.

BOYLE VALVE CO., 2101 LARRABEE ST., CHICAGO

Speaking of Batting Averages**Babe Ruth 393****ANCHOR BULBS 993**

We are out to make it 1,000. Can't be done, you say? Our triple-test has kept one large auto lamp maker from finding a bad Anchor bulb in three years. Laugh that off!

JOBBERS—What's wanted is a lamp that doesn't fail. What's wanted SELLS. The money-maker for you and your dealers is the Anchor: triple-tested, never beaten.

SAME DAY SERVICE

Send a sample order, find out how quickly and accurately we ship; and with it get our prices and generous discounts. Obey that impulse! Write.

Anchor Electric Co.
555 W. Jackson Boul. Chicago, Ill.

Get This "Pioneer" Garage Special



Electric Drill
and Valve Grinder

Greatest time and money saver,
as well as money maker, for
your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.
Incorporated Louisville, Ky., U. S. A.
C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

PARANITE CABLE

Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.

FOR 33 YEARS THE STANDARD

"IF IT'S PARANITE IT'S RIGHT"
Quality jobbers handle quality cable—that's **PARANITE**.



Indiana Rubber & Insulated Wire Co.
Factory and General Offices—Jonesboro, Ind.

ARMATURE REWINDING

We Are
Experts in
The Business



Workmanship
and Service
Guaranteed

1000 SATISFIED CUSTOMERS

Are You One of Them? Save Money by Becoming One.

Fords	\$1.50
Generators all others makes.	\$3.25

DO IT NOW—DON'T DELAY

Write for particulars

PIONEER ARMATURE CO., Inc.
2805 Cottage Grove Ave. Chicago, Ill.

The Bearings Company of America



Your present Thrust Bearings sizes duplicated.

Thrust Ball Bearings made to your B/P's.

Quotations made promptly on all inquiries.



THE BEARINGS COMPANY OF AMERICA, Lancaster, Pa.
Western Sales Office, 1012 Ford Bldg., Detroit, Mich.

Four Operations Without Change of Sockets

The new 1490, Walden-Worcester's speed wrench for mounting Ford wheels, does the whole job without lost motion. The sockets are fixed and have two broached openings each, that take the front hub cone and axle nut—the rear axle nut and hub cap. One more, good and essential wrench.

Made by

Walden-Worcester
Incorporated
Worcester Massachusetts



Dependability
in the new Waukesha Bus and Truck Motor emphasizes itself not only in performance, but in steady low operating cost, especially.

Write for full details

THE WAUKESHA MOTOR COMPANY
Waukesha, Wis.

WAUKESHA
TRADE MARK

BUS and TRUCK MOTORS

ACE HIGH-RATE BATTERY TESTER shows voltage drop and amperes draw

Inspires Confidence
Shows your customer in a positive way when his battery needs repairs or should be replaced with a new one. In addition to profit it adds to the appearance of your shop and inspires confidence in your ability.

Price \$39.50
F. O. B. CHICAGO

Voltmeter and ammeter, precision type, 4 inch diameter, sapphire jewelled. Variable carbon rheostat—0 to 600 amps.

ORDER FROM YOUR JOBBER

WEIDENHOFF 1328 ROOSEVELT ROAD CHICAGO, ILL., U. S. A.

Ask Us About Our Cylinder Internal and Surface Grinders

 HEALD MACHINE CO.
 61 New Bond St.
 Worcester,
 Mass.

MAGNETIC CHUCKS


FOLBERTH
Automatic
WINDSHIELD CLEANER
 Pat. "It Cleans While You Drive"
 THE FOLBERTH AUTO SPECIALTY CO., CLEVELAND

A good profit for you in this wonderful, fast-selling necessity. Ask your jobber or write.


SPENCER
 Should Be On Every Car You Sell
 The Spencer Mfg. Co.
 Spencer Ohio

The Spencer Lock Tilting Steering Wheel first adds comfort in the driver's seat—then protects the car from theft. And the insurance it saves pays back the purchase price. Ask your jobber for details. Made for Ford, Dodge, Overland, Chevrolet 490 and Superior, Maxwell, Star and Gray Cars.


"Dimit"
 Makes night driving safe
 A touch of the toe dims the lights. Simplicity itself. A remarkable seller. A necessity. \$2.50. For all cars. Distributors and Jobbers write at once.
 THE DIMIT CO., 1121 Cathedral St., Baltimore, Md.

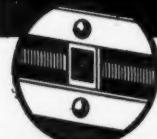
"UNICO" QUICK-SEATING **"UNIC-OIL"**
 Plain Step Cut Oil-Control
PISTON RINGS
 Ask for Samples and Prices
 UNICO MOTOR PRODUCTS CORP., 4969 St. Louis Ave., St. Louis, Mo.


\$1.50
 The Welker-Hoops Mfg. Co., Middletown, Conn.

Welco Accelerator
Quickly installed on Fords
 Works independent of throttle. Adjusting nut sets idling speed. Complete with heel rest, screws and adjusting nut, in attractive carton. Ask your Jobber. Welco Products include Step Plates, Blanket Holders, Gas Tank Caps.

DILL
INSTANT-ONS
 Dust and Valve Cap
 Off or On in 5 Seconds
 The Dill Manufacturing Co.
 Cleveland, O.


Bumpers for all Cars
 The Price and Quality Satisfy
 Complete Catalog on Request
 GEMCO MANUFACTURING CO. 760 So. Pierce St., Milwaukee, Wis.


HALLADAY Bumpers
 "Full Doubleface"; "Doubleface" and "Singleface"—the complete line that ties up least money and still meets every demand. Write for literature, prices, discounts.
 L. P. Halladay Co., Decatur, Ill., U.S.A.

for ALL TYPES of CARS

STUTZ SIX—It's a Great Car
STUTZ Speedway FOUR
 America's Pre-eminent Sport Car
 STUTZ MOTOR CAR COMPANY OF AMERICA, Inc., Indianapolis, Ind.
 Builders of the Original and Genuine Stutz Motor Cars


Lamps and Accessories
 A quality group of fast selling items for every automotive requirement.
 Organized to supply the jobber and dealer exclusively.
 THE CINCINNATI VICTOR CO.
 716 Reading Road Cincinnati, Ohio
 Owners, by purchase, of the Jobbers' Division of the Corcoran-Victor Co.


JACOBS CHUCKS ARE STANDARD EQUIPMENT ON THE BEST PORTABLE DRILLS.
 Write for circular, "A Jacobs Chuck for Every Purpose."
 The Jacobs Manufacturing Co.
 Hartford Conn.

CONDENSITE CELORON
 SILENT TIMING GEARS
Insure perfect timing
 Diamond State Fibre Company


ELGIN QUALITY PISTON PINS
 Regular, Oversize, Orphan Shipped Same Day
 ELGIN MACHINE WORKS Elgin, Ill.

Riecie
 Automotive Products
 Bearing Blue Enamel (Air Drying) Enamel (Cylinder) Fan Belts Gasket Cement Graphite Leather Dressing Metal Polish and Nickel Polish
 Durkee-Atwood Co. MINNEAPOLIS, U.S.A. Established 1910
 Patch Pedal Pants Radiator Cement Orange Shellac Rubber Cement Shellac (Gasket) Spring Lubricant
 Tire Mica and Tire Talc


Replace any lost gas-tank cap from inexpensive assortment of Sterling Tankaps. Accurately machined from white metal alloy, with cork gasket. Write at once for full information. It means a quick turnover and handsome profits.
 STERLING PRODUCTS CORPORATION 2970 N. Market St. St. Louis, Mo.
STERLING TANKAPS FOR ALL CARS

**NONE BETTER
No. 3 Socket Set**

In a baked-on black enamel pressed steel box with cover HINGED at one end. Famous N. B. trademark in gold. Handle $\frac{1}{2}$ " hex, not 7-16". Heat-treated sockets. Jobbers and dealers enthusiastic. Attractive Counter Display holds 10 sets. Retail price \$1.25.

Screw Products Department
THE NEW BRITAIN MACHINE CO., New Britain, Conn.

INSHIELD DRIVING LIGHTS
INSIDE THE WINDSHIELD—NO GLASS TO CUT

Patented Oct. 30, 1923
INSHIELD 8 $\frac{1}{2}$ in. diameter. Heavy Nickel or Black Enamel. Made of heavy sheet brass. 21 c. p. Mazda precision type tipless bulb, silver, triple-plated reflector \$7.50

INSHIELD SENIOR $\frac{1}{2}$ in. diameter. Nickel finish only. Simplest and best inner-controlled driving light made. \$10.00

The Inshield Products Co., Toledo, Ohio
Formerly the Thal & Bitter Machine Co.

DUESENBERG
The Original Straight-Eight
With Four Wheel HYDRAULIC Brakes
INDIANAPOLIS U. S. A.

LINENDOLL EXHAUST HEATER

Attractive in appearance, with cleaning features of removable heating coil with no connecting joints inside the heater pan to leak. Meets instant approval. No odor or noise. Easily installed and operated. Will boost your winter sales—get our attractive trade proposition.

THE NORWALK AUTO PARTS CO.
Norwalk, Ohio

Wood-Imes formerly RED DEVIL

SELF-ALIGNING BURNISHING MACHINE
Makes it possible to fit over-size pistons without removing engine from the car when the variations do not exceed 5/1000 of an inch. Cylinders slightly tapered, out of round, or with shoulders worn by pistons or rings may be made round, straight and true. Price \$25. 12 ounce can Wood-Imes Compound, \$1.50. Write for complete details.

WOOD-IMES MFG. CO., Minneapolis, Minn.
FORMERLY MID-WEST MFG. CO.

THREE PRODUCTS YOU NEED

ZIP FRICTION PASTE, for fitting in bearings.
ZIP GRINDING COMPOUND, for valves.
ZIP LAPING COMPOUND, for lapping in pistons.

The Original Water Mixed. Write for Samples Ask Your Jobber.
U. S. Pat. 1353197 THE ZIP ABRASIVE COMPANY Cleveland, O.
THE ZIP MFG. CO. Denver, Col.

BRUNNER AIR COMPRESSORS

"Good for Twenty Years at Hard Labor"
BRUNNER MFG. CO., UTICA, N. Y.

Be the local Logan Man — Let us show you how easy and how profitable it is to install Logan Ring Gears.

Kaufman Metal Products Co.
Bellefontaine, Ohio

LOGAN FLY WHEEL RING GEARS

Eight body types—\$1295—\$2250

STEPHENS
Finer Motor Cars At Lower Prices

Cold-Drawn Sockets
ALLEN PROCESS MAKING A SOCKET
The Allen Manufacturing Company, Hartford, Conn.

Kelso

BRAKE LININGS and CLUTCH FACINGS
Always used where safety and service are the first and only consideration.

KELSO M'F'G CO., TRENTON, N. J.

At last a real battery clip. GRIP-TITE BATTERY CLIPS grip tighter, open wider, last longer.

DEALERS! JOBBERS!
Write for details.

The Automatic Electrical Devices Company
122 West 3rd St., Cincinnati, Ohio

Grip-tite BATTERY CLIPS
packed in display cartons sell themselves on sight.

TRADE MARK
SAV-OIL
PISTON RING
REGISTERED

IT'S EASY TO SELL
"The only oil ring with a mileage guarantee"
"Sav-Oil" is stamped on bottom of every ring

The Sav-Oil Ring Mfg. Co.
1037 S. Figueroa St., Los Angeles

GIANT LICENSE PLATE HOLDERS
When you lose a license plate the cost is from \$2.50 to \$5.00. With Giant license plate holders you need not fear losing your license plate as they are fastened permanently to the holders and can be installed in one minute's time. Guaranteed to give perfect satisfaction or money refunded. If your jobber cannot supply you, write us direct.

List price 90¢ for four.

RED GIANT TOOL CORP., Lynchburg, Va.

We Re-Babbitt
Prices on exchange of connecting rods
Buick \$2.80
Ford60
Maxwell 2.80
Oakland 2.00
Studebaker 3.00
Discounts to Authorized Service Stations

24 HOUR SERVICE

If you have tried INTERSTATE BEARINGS you will not be satisfied with anything less.

INTERSTATE BEARING CO., Herkimer, N. Y.

YALE OILING SYSTEM FOR FORDS

Trade Mark Pat. June 4, 1918. Other Pats. Pend.

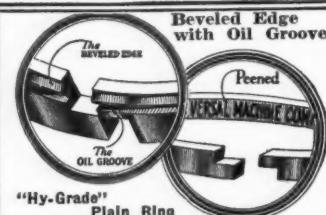
Jobbers cash in now on strong advertising and sales campaign. Over 1,000 Ford dealers sell it. Write for discounts.

Roland & Koch
411 S. Main Street
Los Angeles, Cal.
Waco Sales Co.
Harrisburg, Pa.

Battery Service Equipment!

**UNITRON Rectifier
PORTOSTAT Test Set**
FOREST ELECTRIC COMPANY

New and Wilsey Sts., Newark, N. J.



UNIVERSAL

2 rings that cover
every need

Ground or turned finish
Attractive jobber's proposition

UNIVERSAL MACHINE CO.
BALTIMORE, MD.

COLONIAL CYLINDER HONES \$17.50 PRICES REDUCED ONE HALF \$17.50

You can now buy the Colonial Cylinder Hone, an approved tool for this class of work and one of the best Hones on the market at \$17.50 each F. O. B. Kalamazoo. Made in three sizes, one, two and three, No. 1 $\frac{3}{4}$ " to $\frac{3}{4}$ ", No. 2 $\frac{3}{4}$ " to $\frac{3}{4}$ " bora, No. 3 $\frac{3}{4}$ " to $\frac{3}{4}$ ". Colonial Cylinder Hones are now being used by some of the best factory Service Stations in the country as well as by numerous Service Station Owners.

Colonial Gear & Manufacturing Co., Kalamazoo, Mich.



140 Combinations all in this ONE set

Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.

The Eastern Machine Screw Corp.
10-20 Barclay Street, New Haven, Conn.

There's a WATKINS Branch Near You

If you want genuine Watkins Rebuilt Connecting Rod Service, which includes not only rebabbitting the rod to S. A. E. specifications, but equipping the rod with laminated shims, new bronze piston pin bushing and new bolts and nuts, send your old rods to the authorized WATKINS plant nearest you. Rebuilt rods shipped same day they are received.

WATKINS Complete Rebabbitting Service



WARNER GEAR COMPANY MUNCIE, INDIANA



CLUTCHES, TRANSMISSIONS, CONTROLS, DIFFERENTIALS

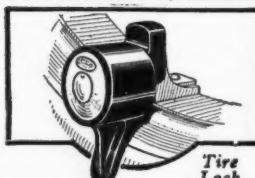
OAKES LOCKS

The Oakes Co., Indianapolis, Ind.

for Spare
Tires and
Wheels

Sell one with
every car

Get Samples



MONOGRAM The Self Locking Radiator Cap

Send Us Your Armature Repair Work

FORD
ARMATURES
REWOULD
\$2.00



MOST ANY
TWO UNIT
GENERATOR
ARMATURE
\$5.00

ALL WORK GUARANTEED—WRITE FOR PRICE LIST
U. S. AUTO SUPPLY CO., 3845-49 S. WABASH AVE., CHICAGO

Summer Engine Performance All the Year

The Bishop-Babcock Aquastat—a simple, positive, automatic control of the cooling system for all cars and trucks using pumps—is guaranteed to produce these results: (1) Adjust the water cooling system to cold weather; (2) maintain constant temperature of the water around the engine; (3) prevent over-cooling; (4) warm up engine quickly and reduce use of choke; (5) save fuel; (6) reduce carbon deposits; (7) reduce dilution of oil in crank case. Ten per cent seepage eliminates any special danger of freezing. Write for Aquastat Sales Plan. The Bishop & Babcock Company, Automotive Specialties Division, Cleveland, Ohio.

BISHOP-BABCOCK
AQUASTAT

Textolite

TIMING GEARS

A General Electric product. Made entirely of cotton fabric processed to wear like iron. Eliminates all noise from the timing gear assembly. For practically all cars. Write for prices.

JOHN C. HOOF & CO.
157 W. Illinois St. Chicago

ZENITH

CARBURETOR

More
Power
Less
Fuel

Zenith - Detroit Corporation, Detroit, Mich.

—the Solution of the
used car problem!

APPLEBY
USED CAR
PLAN

Percy Chamberlain Associates
1320 Book Bldg., Detroit



GAYLORD LITTLE GIANT Water Saver

Cuts your water bills in half by stopping water waste. Screws on end of hose. Gripping the nozzle starts the flow. When nozzle is released, the water stops AUTOMATICALLY. Self-operating. Impossible to get out of order. Made of brass; hose nozzle of pure rubber. List price \$3.00.

THE GAYLORD MFG. CO. Paterson, N. J.

KISSEL

The Custom Built Car



The Aristocrats of
Motordom

7 Models—Open and Closed
Distributors in principal
cities. Open territory now
being closed.

Kissel Motor Car Co.
Hartford, Wis.

“CONNEAUT” Plastic Metallic Packing

Patented

Stops the leaks in automobile water pumps. Mold it with your fingers. Makes a smooth metal bearing—adjustable and practically frictionless. At your Jobber—Get it today. It does the trick. Put up in 1 lb. case. If your Jobber doesn't carry it, write us direct. Price \$1.65 per pound, f. o. b. Conneaut, Ohio.

The Conneaut Packing Company

Conneaut, Ohio

Meilicke Signals



Why Fool With Wood Blocks?

This stand is handier, safer and saves much time. Height adjustment from 10 to 17½ inches fits all cars. Special holding latch wedges tighter as load becomes greater. And the base of the "DICKERSON" AUTO HORSE

is broad and solid—won't sink into soft floors. It pays for itself in the time it saves. Every shop and showroom needs several. Write for Catalog of "Time Saving Shop Equipment".

C. A. DICKERSON COMPRESSOR CORP.
222 Chicago Street, Buffalo, N. Y.



The G L B Protector

Saves your battery—protects your lights—prevents your generator from being damaged by over-heating. Guards charging line, cutout and ammeter.

The price is right—so it sells on sight. A winner among dealers and car owners. You'll be pleased with our proposition.

LUPTON, HILL & LUPTON
Dayton, Ohio

NEVER-LEAK

CYLINDER HEAD GASKETS

Heat-proof Gas-proof Can't blow out Retain their life
Oil-proof Water-proof Last longer Keep customers sold
One for every standard make of car, truck and tractor.

The Fitzgerald Mfg. Co., Torrington, Conn.



MAKE BIG MONEY Charging Batteries

Small cash payment brings you HB 8 hour charging outfit. Easy terms of only \$20 monthly let your profits pay balance with nice surplus besides. Thirty day free trial on money back guarantee lets you try HB outfit at our risk. HB patented voltage-regulating winding absolutely prevents reversing. Saves current. Start now to make big profits with HB 8 hour battery charger. Write today for information. HOBART BROS. CO. Box AR4 Troy, Ohio



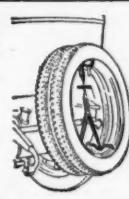
\$700 Profit in One Month

That's what one distributor made. He's only one of many doing a big business. Dealers, too, are making sales by the dozens. Few accessories in recent years have been as popular as the

DUPLEX

Second Spare Tire Carrier & Rim Tool Carries spare tire—also expands and contracts rim when changing tires. Two tools for the price of one. Write for details.

TRIPP-SECORD & CO.
606 Kerr Bldg., Detroit, Mich.



Goodrich AUTOMOTIVE EQUIPMENT Cable

Starting-Lighting-Breaker
Formerly M.R.

THE GOODRICH-LENHART MFG. CO., Hamburg, Pa.

Goodrich Cable is sold in lengths found to be the most popular with the average buyer—coils of 100 ft. packed in individual cartons. Both shop men and car owners like the clean 100 ft. package idea—and this leads to quick and profitable sales.

Send for samples, prices and discounts.



BOSCH

American Bosch Magneto Corp.

Main Office & Works: Springfield, Mass.

Branches: New York, Chicago, Detroit, San Francisco

Over 700 Service Stations and 1400 Dealers



WEAVER GARAGE AND SHOP EQUIPMENT

WEAVER
MANUFACTURING
COMPANY
SPRINGFIELD
ILLINOIS
U.S.A.
Send for Catalog

TESTBESTOS

PAT-OFF.
REG.U.S.
AUTOMOBILE
BRAKE LINING
AMERICAN ASBESTOS CO., NORRISTOWN, PA.

(2408)

Strom
BALL BEARINGS

U. S. BALL BEARING MFG. CO., 4551 Palmer St., Chicago, Ill.

All types and sizes of radial (single and double row), thrust, and angular contact bearings, for new or replacement work.

PORTER REDI-CUT GLASS

For Ford Replacements

The finest quality hand blown triple strength crystal sheet glass cut to exact size and finished on one edge. Packed in a manner that minimizes breakage. Jobbers and dealers can carry stock with little chance of damage. Write for complete details.

PORTER MIRROR & GLASS CO., Fort Smith, Ark.
Automotive Division—3124 Locust Blvd., St. Louis, Mo.

GENERAL ASBESTOS & RUBBER COMPANY

GARCO

ASBESTOS PRODUCTS

Branches
New York Chicago Pittsburgh
Main Office and Factories: Charleston, S. C.



SAVES REPAIR BILLS

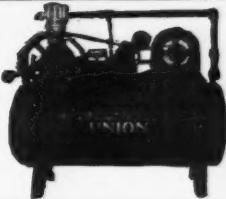
The recent addition of a special transmission oiling unit makes the FORD FAITHFUL Oiling System a most efficient eliminator of all lubricating troubles. Dealers Write

W. O. Thompson Mfg. Co.
330 Mountain View St.
Pasadena, Cal.

PERMANITE

Transmission Lining for Fords
never loses its firm,
velvety grip.

The Rossendale-Reddaway
Belting & Hose Company
NEWARK N. J.



Built For Long Life

In filling tires be sure to get the details of this Model 150 Union Air Compressor of 2 cylinders. Capacity 5 cu. ft. per minute.

Union Equipment Co.
Butler, Pa.

Biflex for every car *Cushion Bumper*

"PROTECTION WITH DISTINCTION"
THE BIFLEX CORPORATION, Waukegan, Ill.

\$50
110 VOLT

PETERSEN
Guaranteed HALF INCH
ELECTRIC DRILL

So powerful that the combined strength of three men could not "stall" it when drilling $\frac{1}{2}$ " holes in steel. Write for miniature catalog describing the complete line of Petersen Portable Electric Tools.

A. H. PETERSEN MFG. CO., 1816-24 Fratney, MILWAUKEE

TEST YOUR BATTERIES by the Chart Method. Something New. Send for free booklet, today.

Allen-Bradley Co.
Electric Controlling Apparatus
281 Greenfield Ave., Milwaukee, Wis.

SHUR-O BATTERY CONNECTORS

A tap with a hammer anchors them into battery terminal—like a nail in a block of wood. Positive metal-to-metal contact. Built to last for years.

BURTON-ROGERS CO.
26 Brighton Ave., Boston

KOKOMO LONG-LIFE TIRES AND TUBES

KOKOMO RUBBER CO., Kokomo, Indiana
131 South Main St.

Kokomo Long Life tires and tubes make money for dealers who handle them.
Kokomo Twin-Grip Fabrics
Kokomo Two-Grip Cords
Kokomo Everlastet Red Tubes
Kokomo Standard Gray Tubes

Six design and style bumpers from which to make selection for all popular make cars
Write for details.

THE BELLEVUE MFG. CO.
Bellevue, Ohio

flatlite

A reflector—not a lens. Greatest dealer opportunity ever offered. Sold either as complete headlamp or simply as a reflector to be inserted in lamps now in use. Write.

THE AMERICAN FLATLITE CO., Cincinnati, Ohio

Thirty-seven
BRANCHES

AHLBERG BEARING COMPANY
321 EAST TWENTY NINTH STREET, CHICAGO ILLINOIS

ALVORD QUALITY TOOLS

Taps, Dies, Cutters, Drills, Reamers
Send for Catalog
ALVORD REAMER & TOOL COMPANY
Millersburg, Pa.

R&V Knight
SIX
"EVERLASTING PERFORMANCE"
Engine Sealed and Guaranteed for 2 Years

R & V MOTOR COMPANY

East Moline, Ill.

The Utmost in Hoisting Efficiency

WRIGHT
MANUFACTURING COMPANY
Lisbon, Ohio, U.S.A.

HIGH SPEED HOISTS

"The Best-Equipped Shop Gets the Business"

Let us send you our FREE Catalogue on

Huetter's
Fly-Wheel Gearbands

Huetter Machine & Tool Co.
546 Kentucky Ave.
Indianapolis, Ind.

KING QUALITY
ALL THE NAME IMPLIES

STEERING KNUCKLE BOLTS AND BUSHINGS
PISTON PINS—PISTON PIN SET SCREWS
Automotive Division
KING SEWING MACHINE CO., BUFFALO, N.Y.

FRONTENAC CYLINDER HEADS
and FRONTY-FORDS

The remarkable showing of the Fronty-Ford in the 500-Mile Race at Indianapolis May 30 was due solely to the performance of the Frontenac Cylinder Head. This Head is adapted for use on your Ford car by its designer and builder, Arthur Chevrolet. Write for FREE Catalog. Book, "How to Build a Fronty-Ford," \$2.00; free with orders of \$50.00 or more.

CHEVROLET BROS. MFG. CO., 410 W. 10th St., INDIANAPOLIS

ESTER Acid-Core Wire Solder

REQUIRES ONLY HEAT

SAMPLE FREE

CHICAGO SOLDER CO., 420 E. WRIGHTWOOD AV.

REPAIRMEN

Here's a new source of profit! Send us your rewind jobs. We are "Armature Winding Specialists." Profit for you in our service. Ford generator armature rewound—\$1.95. Other prices in proportion. All work guaranteed. Write for catalog and prices on all generators.

H. M. FREDERICKS CO., Lock Haven, Pa., U. S. A.



McQUAY-NORRIS PISTON RINGS PISTONS PINS BEARINGS

McQUAY-NORRIS MFG. CO., ST. LOUIS—CONNERSVILLE—INDIANAPOLIS

INTERNATIONAL MOTOR TRUCKS for low-cost hauling

Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.

International Harvester Company of America
(Incorporated)
Chicago, U. S. A.

TAKE THE END PLAY OUT!**WITHOUT PULLING THE MOTOR**

Pat'd 7-22-22

THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

ADJUSTABLE BEARING CO., Inc.
Dept. M. Brazil, Indiana

Monogram Light Distributors

Standard equipment on 114 of America's foremost cars and trucks.
Pass I. E. S. rules and all state tests

MONOGRAM LENS CORPORATION
52 Vanderbilt Ave. New York



Relio, an electric-drive wet grinder for pistons, pins, valves, bushings, \$475.00.
Valvo, an electric-drive bench grinder for valves, valve-seat reamers \$175. See page ads this paper.

Van Norman Machine Tool Co.
Springfield, Mass.

THE CLEARING HOUSE OF THE AUTOMOTIVE INDUSTRY, FOR PARTS, ACCESSORIES, TIRES, MACHINERY REBUILDING, REPAIRING, WELDING AND USED CARS. ALSO HELP AND SITUATIONS WANTED AND MISCELLANEOUS CLASSIFIED ADVERTISING

New and Used Parts

We have one of the largest assortments of parts, that, we believe, has ever been assembled. We are in position to give you prompt service from our large stock, no matter what make or model of car you may have. Write for complete information.

Sander Bros. Auto Wrecking Co.
West Point, Iowa

WRITE US FIRST!

Save Time and Money

We carry a complete line of Automobile Parts
Transmissions (all kinds)
Cylinder Blocks Magnetos (all kinds)
Drift Shafts Carburetors
New Gears (all kinds) Starters
Used Gears (all kinds) Rear Ends
400 Motors of all kinds in stock at all times

WRITE

BENNETT BROS.

Largest Auto Wreckers in the Country
Grant and Water Sts. Pittsburgh, Pa.
Mail Orders Given Prompt Attention

We've Got Everything

In New and Used Auto Parts, Accessories and Supplies, for all makes and models of cars.

Engines; Transmissions; Clutches; Axles; Wheels; Rims; Tires; Radiators; Gears; Axle Shafts; Bearings; Magnetos; Starters; Generators; Coils; Batteries; etc., etc.

Ours is the largest stock of its kind in the world.

Warshawsky & Co.

World's Largest Replacement Parts House
1914 So. State St., Chicago, Ill.
No Branches Ph. Calumet 7315 No Branches

AUTO 2000 Models PARTS

NEW AND USED GEARS, AXLES, BEARINGS, SPRINGS, MAGNETOS, GENERATORS, ETC. JOBBERS IN BANKRUPT AUTO SUPPLIES.

BRIGHTMAN AUTO EXCHANGE
321 Windsor Ave. HARTFORD, CONN.

WICHITA AUTO WRECKING CO.

"The Old Reliable"

Offers you quick service, quality parts and absolute satisfaction,—and our prices are a little lower. We are an old reliable house and all that implies. Our stock of parts is one of the largest in the country—from a 1907 one cyl. Reo to a 1921 Overland Four.

Wichita GIVE US YOUR NEXT ORDER Kansas

ANY PART for ANY CAR NEW or USED Send for Catalogue
Cincinnati Auto Parts & Wrecking Co.
712-714 Walnut St.
CINCINNATI, OHIO
Parts our middle name

BOSCH MAGNETOS

GENUINE GERMAN BOSCH MAGNETOS, enclosed type, with platinum points, at a sacrifice. At the rate these magnetos are selling, we expect to be sold out within 30 days.

OUR PRICE	LIST PRICE
ZH6 \$18.00	\$ 60.00
ZH6 15.00 (M14)	60.00
ZR4 (2 spark) single	\$30.00
ZU4 (2 spark) dual	100.00
ZU4 (2 spark) dual	100.00

These are brand new and packed in the original cases.

Order at once as they are going fast.
WRITE—WIRE—or PHONE No. 3-5972
Special price if bought in quantity. How many can you use?

CONN. AUTO PARTS CO.
36 Morgan Street, Hartford, Conn.

SAVE ON THE INITIAL COST OF ELECTRICAL EQUIPMENT

Our new and properly rebuilt electrical equipment is priced to save you money and is guaranteed against any defects. Before purchasing motors, generators and transformers, write for our bulletin A-12. Over 8,000 machines in stock.

THE FUERST-FRIEDMAN COMPANY,
Cleveland, Ohio

PATENTS

BOOKLET FREE PROMPTNESS ASSURED HIGHEST REFERENCES
Send drawing or model for examination and report as to patentability

WATSON E. COLEMAN, Patent Lawyer
644 G Street, N. W., Washington, D. C.

Attorney-at-Law and Solicitor of Patents

C. L. PARKER

Formerly Member Examining Corps., United States Patent Office

American and foreign Patents secured. Searches made to determine patentability and validity. Patent suits conducted. Pamphlet of instruction sent upon request.

McGill Building, WASHINGTON, D. C.

"No Leak O" Piston Rings, nearly all sizes, packed twelve in a box, any quantity at 50% off list, terms cash. Leather Fan Belts for Fords, \$12.00 per hundred.

E. A. BOWMAN, INC.
41 Harper Ave. Detroit, Mich.

DOWMETAL PISTONS

Lighter, stronger, and longer wearing than aluminum or iron. Can be fitted with bronze bushings in the wrist pin holes same as in iron pistons. Dowmetal has no permanent growth. The expansion is little more than iron.

SEND FOR PARTICULARS
LAMMERT & MANN CO.
Cylinder and Crankshaft Grinding
215-21 N. Wood St. CHICAGO Phones West 4918

FOR SALE

Well equipped Garage Business and Dodge Service Station in a fine fast growing Florida town of 5000. Best class of winter and local trade. Do no Ford or cheap car work. Last year's business \$20,000. Owners have other business interests which demand more attention. Price \$3,000 cash. Includes up-to-date wrecking car, stock of parts accessories, electric and other tools.

Address Box E-6093, care of Motor Age,
5 S. Wabash Ave., Chicago, Ill.



Newer and Bigger — Ready NOW!

The famous Snap-on "What Car Do You Drive?" book, newly edited, thumb-indexed, and prescribing Snap-on Selected Kits for over fifty cars, is ready now to make you a socket wrench expert. Write today for details of how it does it.

We shall exhibit at the New York Automobile Show, 258th Field Artillery Armory, January 5 to 12, 1924—space No. 119 Main floor.—And at the Chicago Automobile Show, Coliseum and the First Regiment Armory, January 26 to February 2, 1924—space No. 46 in basement of Coliseum Annex.

MOTOR TOOL SPECIALTY COMPANY, Distributors
14 E. Jackson Blvd., Chicago

SNAP-ON WRENCH COMPANY, Manufacturers
Milwaukee, Wisconsin

Snap-on

INTERCHANGEABLE
Socket Wrenches

SAVE TIME WITH
The Cincinnati "Junior"
1/4" PORTABLE ELECTRIC HAND DRILL
BALL BEARING - WEIGHT 5 LBS.

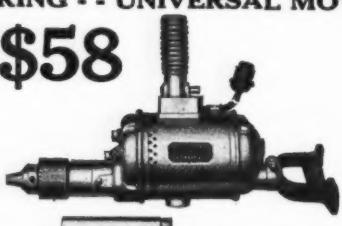


PRICE \$28

Pistol Grip with Automatic Switch. Mandrel with emery wheel or buff for light grinding and polishing. Bench base with clamp for holding drill for above work.

1/2" "Special" Drill
BALL BEARING - UNIVERSAL MOTOR

PRICE \$58



Powerful, durable, compact. Combination Bench Drilling Stand for use with this drill.

A complete line of Portable Electric Drills, Grinders and Buffers. Send for Catalog.

THE CINCINNATI ELECTRICAL TOOL CO.
1515 Freeman Ave.,
New York Seattle
50 Church St. 1115 Federal Ave.
San Francisco
918 Hearst Bldg.

Cincinnati, Ohio
Philadelphia
1220 Real Estate Trust Bldg.
Los Angeles
510 Equitable Bldg.

I ndex to the

The Advertisers' Index is published as a convenience and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

A. C. Spark Plug Co.	76 & 77, 79	Dimit Co., Inc., The	116
Adjustable Bearing Co.	121	Duesenberg Auto & Motors Co.	117
Ahlberg Bearing Co.	120	Dunn Mfg. Co.	111
Akron-Selle Co.	105	Durant Motors, Inc.	91
Albertson & Co.	69	Durkee-Atwood Co.	116
Allen-Bradley Co.	120	Eagle Machine Co.	108
Allen Mfg. Co., The	117	Eastern Mach. Screw Corp.	118
Alvord Reamer & Tool Co.	120	Eaton Axle & Spring Co.	87
American Asbestos Co.	119	Edelmann, E., & Co.	109
American Chain Co., Inc.	57	Elcar Motor Co.	96
American Flatlite Co.	120	Elgin Machine Works	116
Anchor Electric Co.	115	Essex Motors	Ft. Cov.
Arrow-Head Steel Prod. Co.	70	Fisk Tire Co., Inc.	60
Atwater Kent Mfg. Co.	84	Fitzgerald Mfg. Co.	119
Auto Spring Control Co.	110	Folberth Auto Spec. Co.	116
Automatic Electric Devices Co., The	117	Follett Time Recording Co.	114
Automotive Gear Works, Inc.	124	Forest Elec. Co.	118
Bearings Co. of America	115	Foster-Johnson Reamer Co.	110
Bellevue Mfg. Co.	120	Franklin Air Compressor Wks.	114
Biflex Corp., The	120	Fredericks, H. M., Co.	121
Bishop & Babcock Co.	118	Freeman, S. T., & Co.	104
Black & Decker Mfg. Co.	114	Fulton Co., The	61
Blake Automotive Corp.	108	Gates Rubber Co.	97
Bosch Magneto Corp., American	119	Gaylord Mfg. Co.	118
Bosch, Robert, Magneto Co.	108	Gemco Mfg. Co.	116
Bowser, S. F., & Co.	72	General Asbestos & Rubber Co.	119
Boyle Valve Co.	114	General Automotive Corp.	118
Broderick & Bascom Rope Co.	112	General Storage Battery Co.	114
Brunner Mfg. Co.	117	Gilligan Mfg. Co., The	112
Burton-Rogers Co.	120	Goodrich, B. F., Rubber Co.	3
Cadillac Motor Car Co.	59	Goodrich-Lenhart Mfg. Co.	119
Carr Fastener Co.	74 & 75	Green Engineering Co., The	109
Case, J. I. T. M. o.	85	Gurney Ball Bearing Co.	112
Chamberlain, Percy, Associates, Inc.	118	Halladay, L. P., Co.	116
Chase, L. C., & Co.	4	Hall Cylinder Hone Co., The	104
Chevrolet Bros. Mfg. Co.	120	Haynes Auto. Co.	8
Chicago Solder Co.	120	Heald Machine Co.	116
Cincinnati Electrical Tool Co.	122	Hess Carburetor Co.	111
Cincinnati Victor Co., The	116	Higgin Mfg. Co., The	108
Clearing House	121	Hobart Bros. Co.	119
Colonial Gear & Mfg. Co.	118	Hollenden Hotel	113
Comfort Ptg. & Spec. Co.	82 & 83	Hoof, John C., & Co.	118
Conneaut Packing Co.	118	Huetter Mach. & Tool Co.	120
Crosley Mfg. Co.	93	Diamond State Fibre Co.	116
Curtis Pneumatic Mach. Co.	123	Indianapolis Pump & Tube Co.	110
Dickerson, C. A., Compressor Corp.	119	Indiana Rubber & Insulated Wire Co.	115
Dill Mfg. Co.	116	Inshield Prod. Co., The	117

Advertisements

International Harvester Co.	121
Interstate Bearing Co.	117
Jacobs Mfg. Co.	116
Johnson Gas Appliance Co.	112
Kauffman Metal Prod. Co.	117
Kelso Mfg. Co.	117
King Sewing Mach. Co.	120
Kissel Motor Car Co.	118
Kokomo Rubber Co.	120
Landis Tool Co.	90
Laurel Motors Corp.	114
Little Wonder Valve Tool Co.	89
Louisville Electric Mfg. Co.	115
Lupton, Hill & Lupton Co.	119
McQuay-Norris Mfg. Co.	121
Manley Mfg. Co.	112
Meachem Gear Corp.	113
Meilicke Calculator Co.	119
Milwaukee Die Casting Co.	113
Milwaukee Motor Products Co.... 3d Cov.	121
Monogram Lens Corp.	121
Moon Motor Car Co.	1
Moore & Moore, Inc.	110
Motor Wheel Corp.	Bk. Cov.
Murray Tire & Rubber Co.	100
Muzzy-Lyon Co.	78
Nash Motor Co.	6
National Automobile Shows	94
New Britain Machine Co., The	117
New Departure Mfg. Co.	114
No-Leak-O Piston Ring Co.	2d Cov.
North Bros. Mfg. Co.	107
Norwalk Auto Parts Co.	117
Oakes Co., The	118
Oakland Motor Car Co.	65 to 68
Olds Motor Works	95
Packard Elec. Co., The	88
Perkins-Campbell Co., The	109
Peterson, A. H., Mfg. Co.	120
Pfaltz Mfg. Co.	114
Pierce-Arrow Motor Car Co.	92
Pioneer Armature Co., Inc.	115
Porter Mirror & Glass Co.	119
R. & V. Motor Co.	120
R. I. V. Company	106
Red Giant Tool Corp.	117
Republic Motor Truck Co.	62 & 63
Richards-Wilcox Mfg. Co.	98
Roland & Koch	117
Rossendale-Reddaway Belting & Hose Co., The	119
Russell, Burdsall & Ward Bolt & Nut Co.	86
Sales Equipment Co., Inc.	99
Sav-Oil Ring Mfg. Co.	117
Service Equipment Associates	120
Shaw-Walton Co.	112
Sherer-Gillett Co.	105
Smith's Inventions, Inc.	106
Snap-On Wrench Co.	122
Spencer Mfg. Co., The	116
Stephens Motor Car Co.	117
Sterling Prod. Corp.	116
Stevens & Co.	111
Stewart, F. W., Mfg. Corp.	111
Storm Mfg. Co.	112
Studebaker Corp.	5
Stutz Motor Car Co.	116
Thermoid Rubber Co.	7
Thompson, W. O., Mfg. Co.	119
Thomson Mfg. Co.	109
Timken Roller Bearing Co.	64
Tripp-Secord & Co.	119
Tuthill Spring Co.	71
Unico Motor Prod. Corp.	116
Union Equipment Co.	119
U. S. Auto Supply Co.	118
U. S. Ball Bearing Mfg. Co.	119
U. S. Electrical Tool Co.	101
Universal Industrial Corp.	103
Universal Machine Co.	118
Van Norman Mach. Tool Co.	121
Victor Peninsular Co.	107
Walden-Worcester Co.	115
Wall Pump & Compressor Co.	81
Warner Gear Co.	118
Watkins Mfg. Co.	118
Waukesha Motor Co.	115
Wayne Tank & Pump Co.	2
Weaver Mfg. Co.	119
Weidenhoff, Joseph, & Co.	115
Welker-Hoops Mfg. Co.	116
Whitney Mfg. Co.	113
Wood-Imes Mfg. Co.	117
Wright Manufacturing Co.	120
Zenith-Detroit Corp.	118
Zip Mfg. Co., The	117

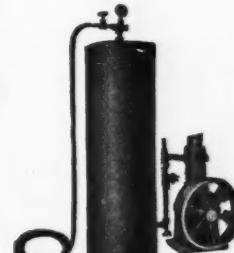


Real Air Service in This Curtis

THE above illustration is the Curtis Style V Two-stage Outfit—one of the family of popular Curtis Outfits—the last thing in air compressor design—free of complicated parts—built for hard usage and will be on the job all the time. $\frac{1}{4}$ to 3 H.P.—automatic.

Single and Two-stage Many Sizes and Styles

We manufacture a complete line of single and two-stage outfits. You are sure to find one that will meet your particular needs in style, size and price. Write at once for full information and descriptive literature. Use the coupon below, or a postcard will do.



Style "S" Single Stage Outfit. Belted only. Five sizes— $\frac{1}{4}$ to 3 H.P. motor required.

CURTIS PNEUMATIC MACHINERY CO.
1527 Kienlen Ave. • • • St. Louis, Mo.

Branch Office:

530-H Hudson Terminal • New York City



USE THIS

AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES

COUPON

CURTIS PNEUMATIC
MACHINERY CO.

Established 1854

1527 Kienlen Ave.,
St. Louis, Mo.

Gentlemen: Please send me full details on Curtis Air Compressors—your proposition and prices.

Name.....

Address.....

Jobber's Name.....

Address.....



Our 9 Sales Branches
carry complete stocks.
Address Automotive
Gear Co., as follows:

ATLANTA

174 Spring St.

BOSTON

1024 Commonwealth Ave.

CHICAGO

1425 S. Michigan Ave.

CLEVELAND

6305 Euclid Ave.

LOS ANGELES

1213 S. Hope St.

PHILADELPHIA

1404 W. Girard Ave.

SAN FRANCISCO

818 Van Ness Ave.

SEATTLE

520 E. Pike St.

RICHMOND, INDIANA

Factory

Double Diamond Gears

**"Every Double Diamond Gear
Is A Nickel Steel Gear"**



Double Diamond "Nationalized Gear Service" reaches to every section of the country. Every dealer, every service station, every repair shop has quick access to this service. For the reason that when gears are needed they are needed in a hurry we have built up a system of nation-wide distribution. In every state there is at least one jobber (in most states more) who carries a stock of Double Diamond differential and transmission gears.

Our nine sales branches listed above keep our jobbers supplied. Every branch carries a complete stock of differential and transmission gears for practically all cars. Orders are shipped the same day received.

Jobbers are authorized to give an absolute guarantee with every Double Diamond Gear. No one is required to take chances.

Write for the name of the jobbers in your territory carrying stocks—also complete price lists.

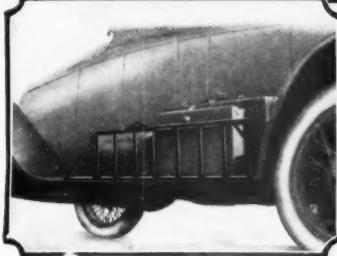
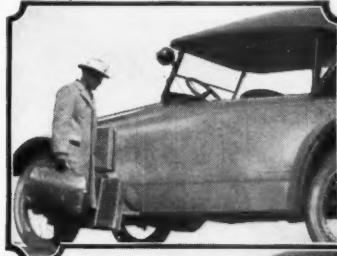
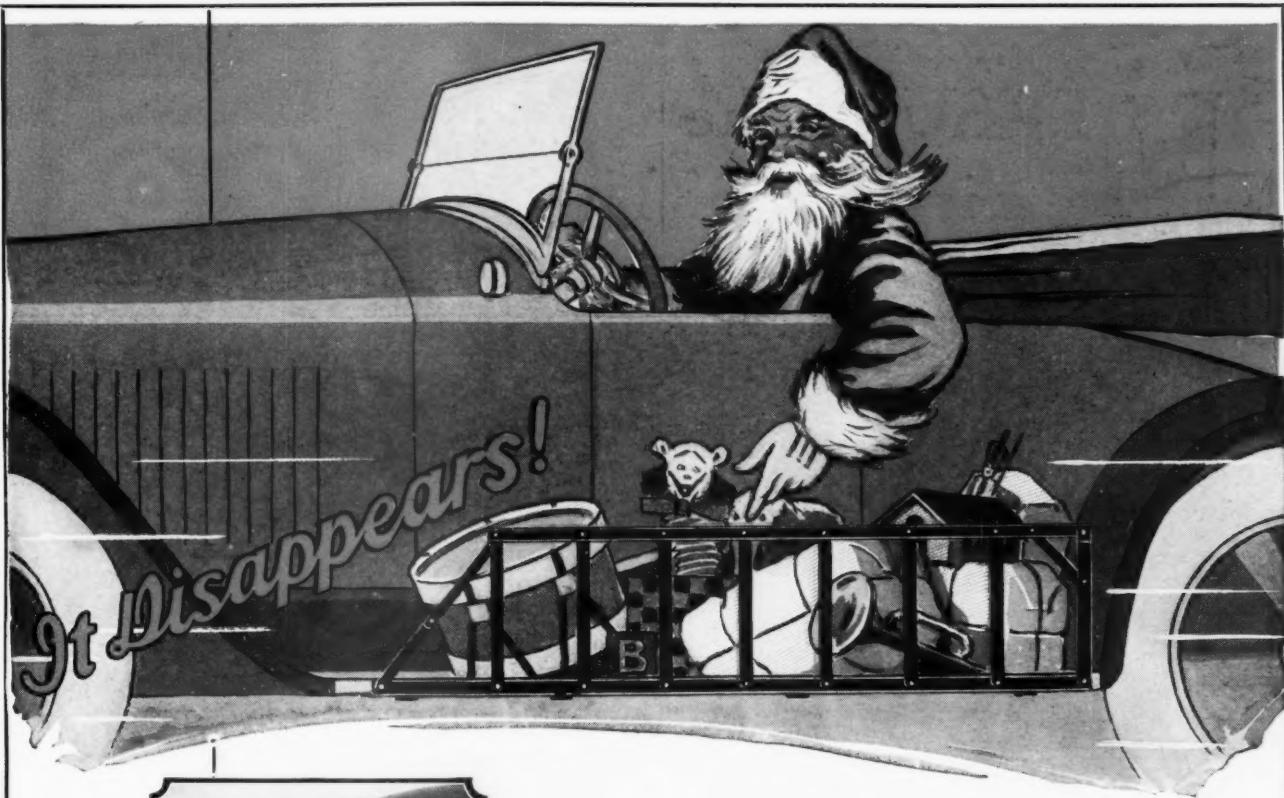
AUTOMOTIVE GEAR WORKS

INCORPORATED



Factory & General Offices
8th and South O. Sts.,
Richmond, Ind.

Export Office: 30 Water St., New York, N. Y.



GRIP RACK comes in stout, handy-size, individual cartons. Easy to display.

For Christmas Business —this Ever-Useful Carry-All

SELL the Milwaukee GRIP RACK for Christmas—before Christmas. Show your trade how this neat-folding luggage holder makes shopping easier, how it is as convenient in winter for business and suburban use as in summer for touring or sport use.

Display GRIP RACK prominently. Demonstrate its *disappearing* feature. That's the big selling point. Show how it snaps open instantly into a good-looking, roomy carry-all; how it folds down, out of sight and out-of-the-way when not in use. A permanent addition to the car—bolts solidly to running-board—reinforces it.

GRIP RACK appeals to every man who takes pride in his car. Ford owners are buying thousands at \$5. Longer sizes for larger cars selling fast at \$6 and \$7. All because GRIP RACK has real selling points—good looks, convenience, all-year utility, durability, and above all its ability to disappear.

Feature the GRIP RACK, at Christmas time and *all* the time. It's worth pushing. Three sizes, to fit all cars. Retails at \$5, \$6 and \$7, according to length.

Order from your jobber. Write us for descriptive literature.

MILWAUKEE MOTOR PRODUCTS, INC.
MILWAUKEE WISCONSIN

M I L W A U K E E
GRIP RACK
MADE BY THE MANUFACTURERS OF THE MILWAUKEE TIMER

Tuarc-Disteel-Forsyth

MEASURE the
eminence of
Motor Wheel Products
by counting the cars at
the shows this year,
on Tuarc, Disteel and
Forsyth steel wheels.
Incontestably, the
prevailing steel wheels.

MOTOR WHEEL CORPORATION

Wood Wheels Steel Wheels Stampings

Lansing, Michigan

